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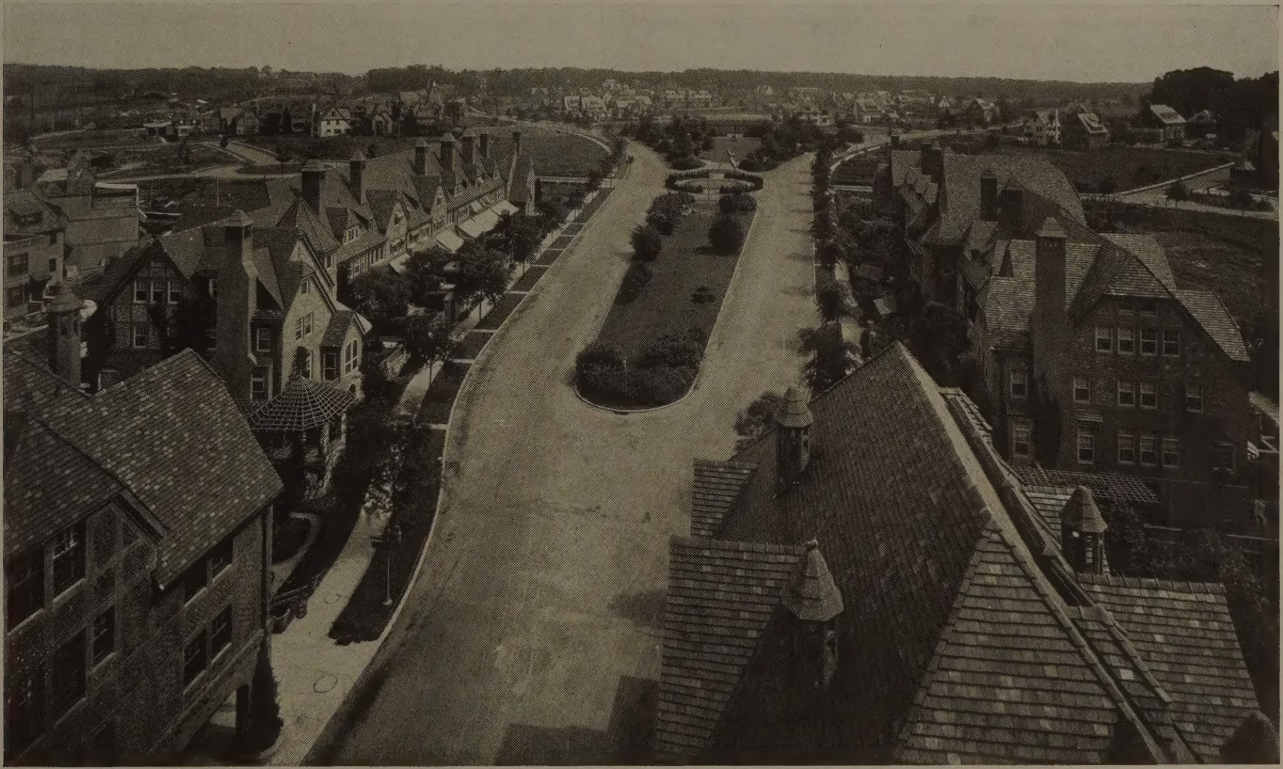

THE VILLAGE GREEN FROM HOTEL TOWER.

Forest Hills Gardens from the Town Planning Viewpoint

By Charles C. May

IT has become trite to make the Russell Sage Foundation development at Forest Hills the subject for pages of rhapsodic eulogy. Much of what has been written has been marked by fulsomeness rather than by discrimination. The emphasis, too, has been placed very largely upon details—a house here and there, a group or two selected at intervals, and the customary glimpses of Station Square.

Yet in the majority of this mass of published material there has been little more than appreciation of obvious aspects; there has been only the slightest attempt to get beneath the surface of things; to seek after causes; to analyze into its elements the development of ideas made objective in the views with which we have become familiar.

We do not advocate a general picking to pieces of street picture, vista and details—destroying the enjoyment of the flower by tearing apart its petals; but we *would* go far enough in such a process to give, if possible, a more general understanding of the kind of problems involved. This is a really tremendous task—transforming within a space of five years a flat expanse of meadow and woodland, into the populous organization of a town, alive with activity, filled with the picturesque, and already beginning to hint at weathering. Good taste is everywhere evidenced, but good taste has not alone built this machine, put life into it and set it working—these things come only through prayer and fasting—and eternal hard work.

Now that Forest Hills is just beginning, in certain spots, to give hints visually of the aspect which has existed since 1909, in the minds of its creators, Messrs. Grosvenor Atterbury and Frederic Law Olmstead, it is interesting to observe in how many respects the distinction and quality which it is universally held to possess, are due to, and proportionate with its exemplification of the principles of town planning; how the knowledge and employment of these principles has lifted

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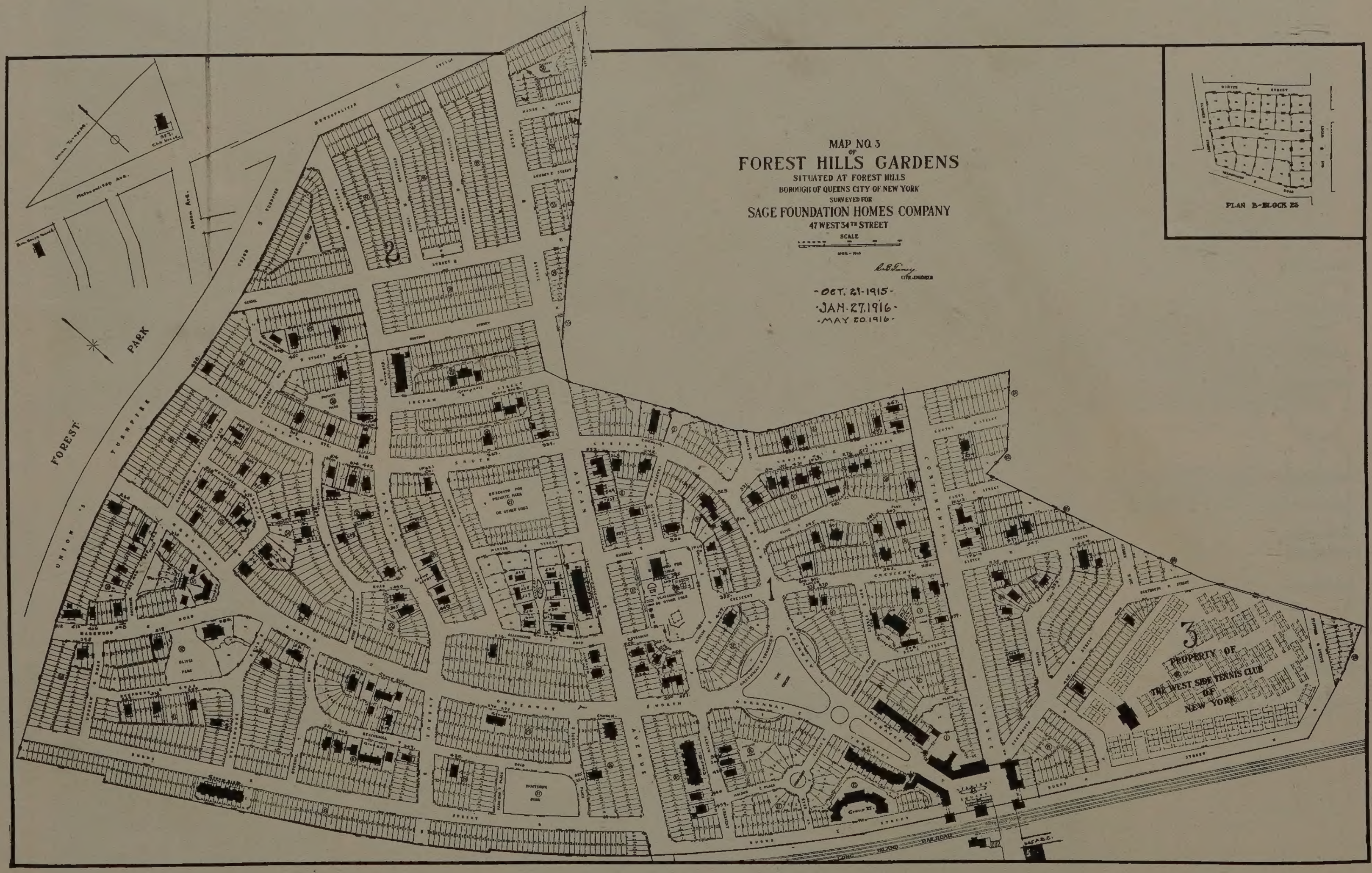
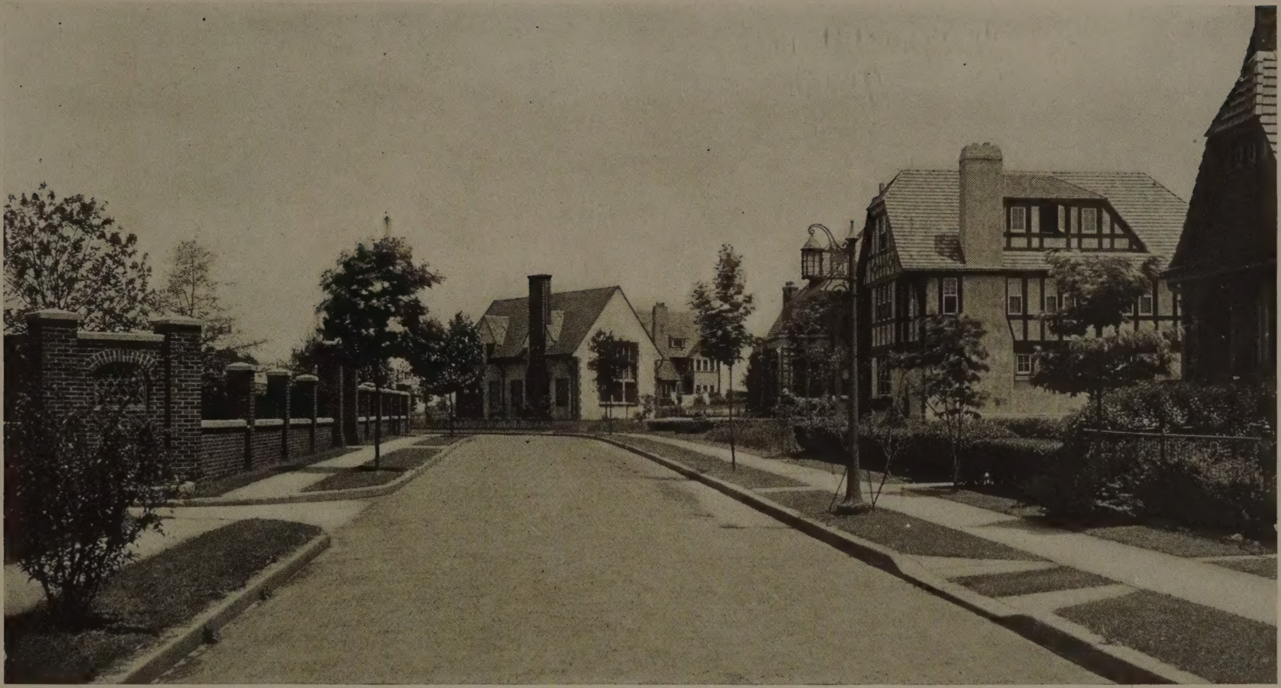


PROGRESS PLAN, FORERT HILLS GARDENS, LONG ISLAND.



VISTA, ROCKROSE PLACE.

(*Continued from page 161*)

it above the average run of real estate development; and further, when the latter share in some degree these qualities, how often it is because they too have grasped and utilized the methods of the town-planner.

Any attempt at analysis must go back to the very anatomy of the district, that is to say, its street system, and the way its own street layout is tied in with the broader one of the city itself. So we find the circulatory system of Forest Hills attached very definitely to the main traffic arteries leading from the Queensboro Bridge on the one side and from Brooklyn on the other; the two being cross connected within Forest Hills itself by the three main lines of communication.

Any great emphasis placed upon a clean cut, well-developed circulation system might have seemed over-academic back in 1909 when the prospect seemed to promise no more than the usual light traffic requirements of the village. Since then the demands have multiplied amazingly—due not only to the unexampled increase of motor traffic within the period, but particularly to the totally unforeseeable emergency load imposed by gatherings of many thousands of people, such as for the past two years have occurred at the West Side Tennis Club. The ease, orderliness and lack of congestion with which these masses of people and streams of vehicles were handled was impressive.

It was made possible by the possession of a system of main traffic arteries, independent of the short residential streets, and the articulation of this system with the natural lines of travel to and from both boroughs of the Greater City. It was a most striking instance of the way in which a well-planned street system lends itself to unforeseen demands that would swamp an ill-considered, inflexible layout. It is, moreover, a warning to the town planner against the sin of under-planning, the temptation to provide only for requirements within sight at the moment. The factor of safety can never be foregone with impunity.

A walled town in America would be perhaps insulting to the genius of our institutions. Certainly it would be a rank anachronism. Yet we remember and recognize the charm, and self-contained unity gained by so many mediaeval European towns by virtue of the encircling wall that binds together all the loose ends of settlement and prevents them from straggling. The contrast presented by the usual American town needs no comment other than to point out the fact that encircling walls and dread of attack might have saved us from the universal aspect of these outskirts—the regions of squatter huts, of corrugated iron architecture and of scavenging goats—such a region, by the way, as some of that neighboring Forest Hills itself.

Forest Hills would doubtless be spared such conditions at its outer boundaries by the benevolent restrictions of its rulers, but their task is made superfluous by the fortunate fact that the community is delimited by well defined boundaries along the greater portion of its periphery. The railroad embankment is doubtless not commonly regarded as an asset to the village as a whole, yet it plays an important function in preserving the entity of the development on that side, exactly as the bordering turnpike does on the other. One needs only to recall the treatment of many railroad cuts and embankments among the suburbs of Boston to realize how the objectionable elements may be discounted, and the embankments clothed with growing things till they possess a double value to the community—for the loveliness they show forth in themselves and for their service in bounding the settlement. Some such treatment, we have no doubt, is slated for Forest Hills.

A further value lies in the point of vantage from which one first views the station square and the village beyond. Here was a natural, or rather a pre-determined feature seized upon and utilized in the permanent development, just as were the clumps of forest, the knolls, and the other none-too-numerous landmarks of the village site. This utilizing fixed conditions as determining points in the design, is so elementary a principle of the town-plan that mention of it ought to be superfluous—and so it would be if transgressions of the law were less than every-day occurrences.

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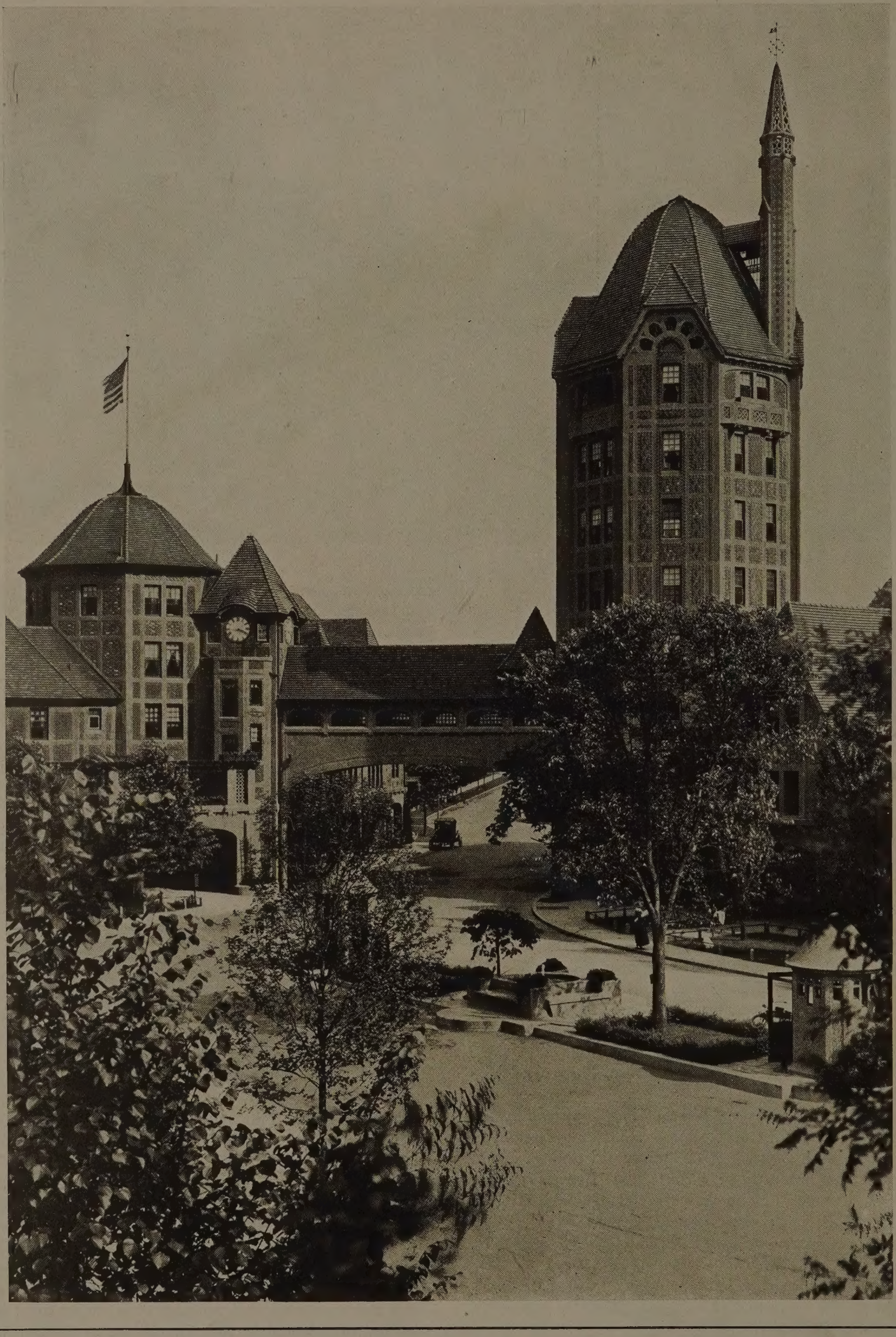
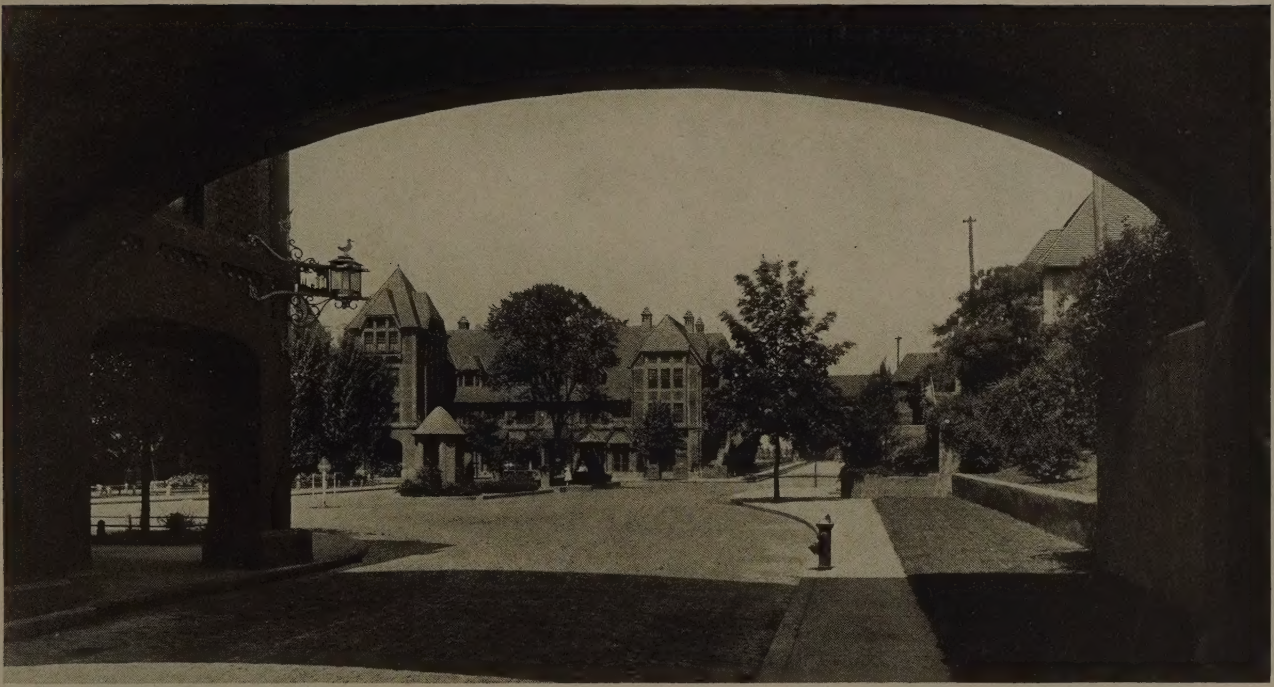


STATION SQUARE SHOWING HOTEL. Grosvenor Atterbury, Architect.



STATION SQUARE FROM THE EAST.

(*Continued from page 163*)

One can picture with not much mental strain, a traveler of a future century standing at certain points in and near Station Square and (if we conceive him equipped with no more than this-century knowledge as regards town planning) pondering whether this picturesque grouping of irregular ground-plan, this piling-up of roof masses, these fragmentary vistas, were actually the result of deliberate planning on paper, or were not the ultimate expression of a gradual growth along unrestricted lines. Such discussions we are familiar with concerning the traditional examples of European mediaeval towns. The case for conscious design in these entirely irregular, apparently haphazard arrangements of plan, street widths and lotting, has been most forcibly presented by Camillo Sitte, the eminent German town planner. Indeed, it is not too much to say that the entire method in German street and site planning of the present day is molded upon his reasoning. In many respects the plan of Forest Hills is akin to those of the modern German school. There is the same picturesque irregularity, the same variety of street width and setback. There is breadth without monumentality; balance without symmetry. In the planning of open squares the streets diverge at peculiar angles—with this difference, that in the German work the vista almost never leads *through* the square or enclosed place; almost invariably the vision is limited by the opposite side of the square, and the greatest care is used in the location of buildings which are to perform the function of closing these vistas.

The street plan of Forest Hills is based upon a judicious balance between straight and curvilinear roads. The former are never numerous to the point of becoming tedious; the latter never degenerate into the aimless wandering lines which become so exasperating when carried to excess. One cannot afford to be dogmatic as to a proportion between the two sorts of street, nor can one lay down rules beyond the most general. No town-plan is worthy the name unless it is governed by—in fact, is the direct outcome and expression of, the local, fixed conditions. It is axiomatic that in rolling or hilly country the curved street is the logical means to avoid steep grades, to afford the best building sites, and to take advantage of the finest outlooks. Where not subject to the dictates of grades, however, the use of curves is more inclined to artificiality, more of a temptation toward stunts, and more apt to be abused. There is, besides, the undesirable drawback, that, curved streets of short radius, used for residential side-streets, lay exaggerated difficulties upon the site planner—that is, the greater the irregularity of roadway, the greater will be the problem of subdivision into lots, and the successful and economical placing of

As Mr. Raymond Unwin points out, it is comparatively easy to design an interesting, picturesque house or group of houses for a lot of regular outline, where such a need arises; but in the converse problem, when the call is for a quiet, unbroken mass of dwelling and roof to be placed on a lot of broken, eccentric shape, the difficulties are immeasurably magnified.

The individual problem, then, carries its own set of conditions which must dictate, or at least suggest to the town planner the solution of his street layout problem, nor can any set of rules replace his own study, knowledge, resourcefulness and restraint.

Coming back to Forest Hills, we note that its whole system of roadways, starting from the more or less fixed arteries of through traffic, is based upon and built up from the two main streets whose wide curves converge at the village green. With these two as the motive of the design, the pattern of the plan has been elaborated, and it will be found that most of the other curved streets have their reason in the local topography, Either they skirt the base of a knoll, they explore the lines of a piece of woodland, or they swing around to bring into its most advantageous view an important building site. In other words, they have a reason for existing; they are not curves for the sake of curving.

Except for a few of the main traffic streets, Forest Hills is very modest in the widths of its roadways. The idea of living on a boulevard has a glamour about it which has attained a certain vogue. Forest Hills has turned its back upon

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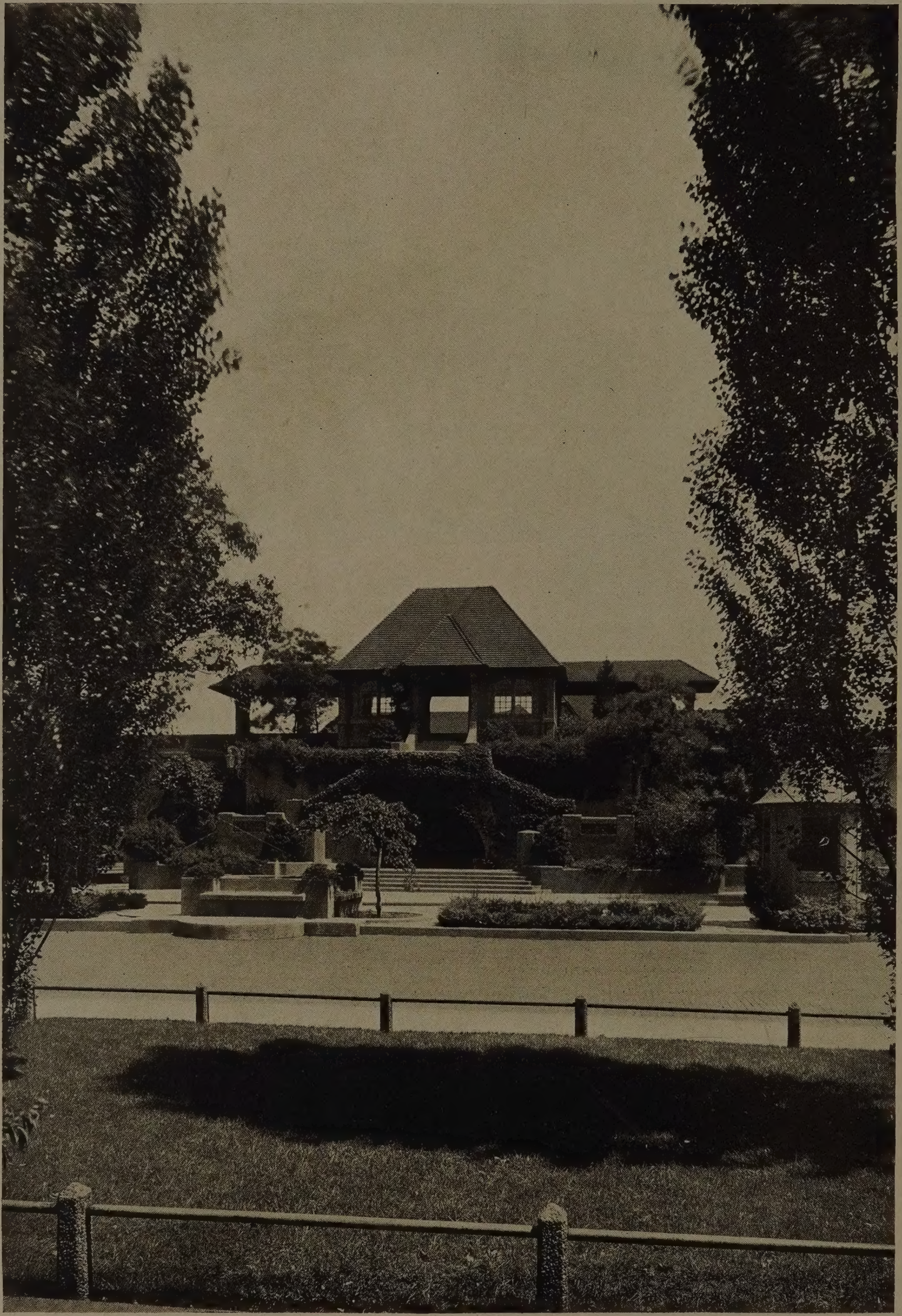
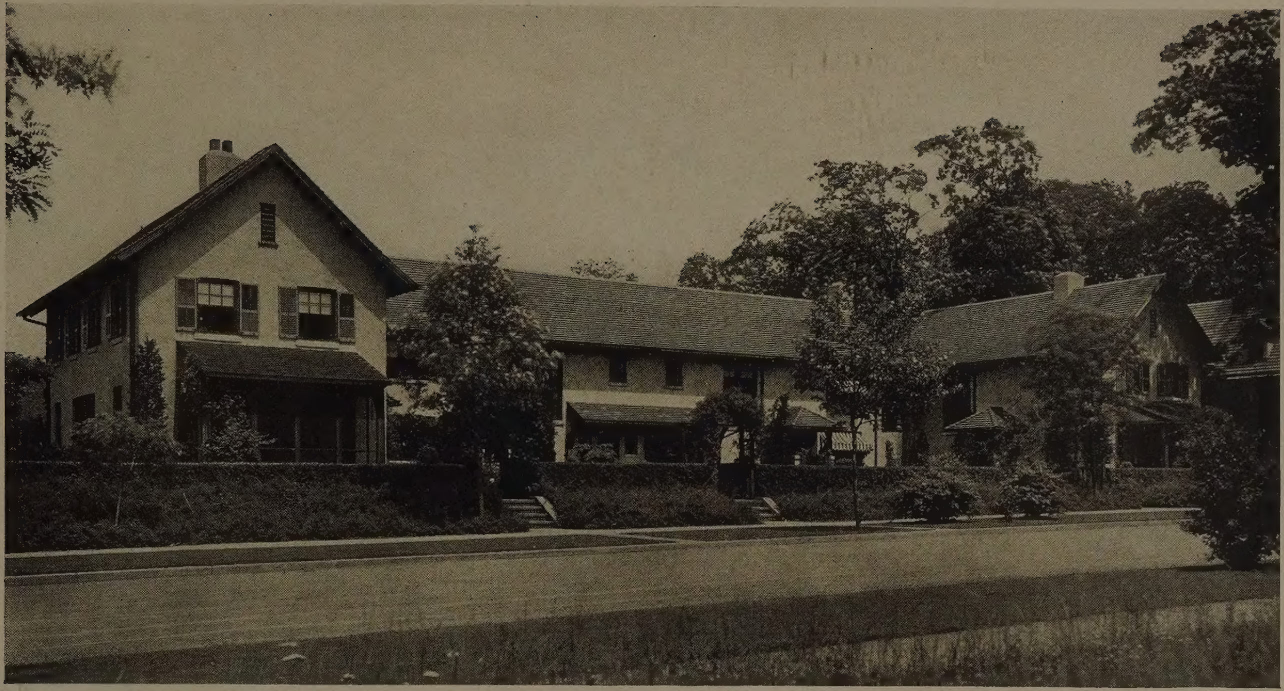


RAILROAD STATION FROM HOTEL. Grosvenor Atterbury, Architect.



TYPICAL GROUP AND PLAN. Wilson Eyre, Architect.

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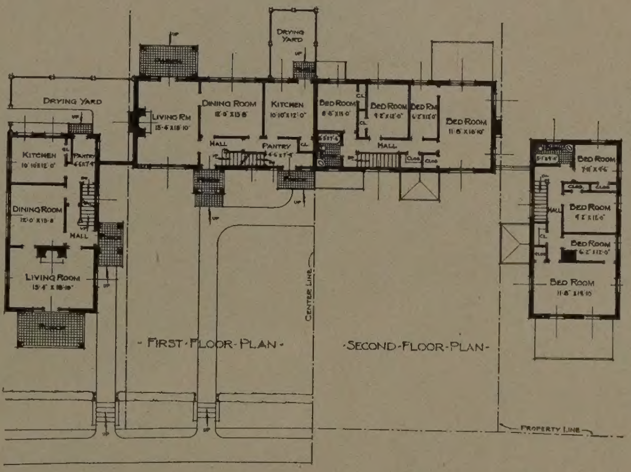

the principle, and Forest Hills is thereby the gainer. Residential streets of boulevard width have some distinct drawbacks—their excessive costs, not only for construction and upkeep, but for the otherwise saleable area they occupy; their temptation to motor and other traffic to make use of roadways where they do not belong; such roadways, if confined to local traffic, could properly be made of lighter, less costly construction, and less tangible than the above but perhaps most important of all—their utter destruction of that sense of homely intimacy which is always connected with the address "Road," "Place," "Lane," "Close," but never by any chance suggested by "Boulevard" or "Avenue."

The soundness of this principle of fitting the kind of street to the kind of work it is expected to do, is just now in a fair way of being recognized by NewYork City; for these matters of street width and street use are inextricably tied up with the others of zone restriction and height restriction.

Precedent has been followed with only occasional deviations in the matter of the lotting of Forest Hills. That is to say, the 20 or 25 x 100-ft. lot has been taken as the typical unit, and the larger landholds are simply multiples of the small ones. Treated in the ordinary, time-dishonored manner, this shape of lot means inevitably that the street picture becomes a succession of gable ends—of deadly monotony if of common type, and of jarring angularity, if of unrelated design. It is in this respect probably, that the benificent results of the town planner's skill is most apparent to the lay mind. Nowhere does a street present the unfortunate vista of eternal angles which would have been the result of unrestricted or misdirected growth. An even spotting of minute dots (as individual dwellings are when viewed from the town planner's scale) has been avoided chiefly in two ways—first, by variations in the set-back from the street and grouping a number of single houses into a composition of large scale; second, by combination of a greater or smaller number of dwellings under a single roof of dominating size and design. There are, of course, additional methods produced by endless variations and combinations of the above two primary ones—the commonest being the composition whose elements are a central group of two or more dwellings, flanked by single-family houses, in various relations to the central mass.

Another method of lotting, with a view to bettering the street picture, has some unquestioned advantages, and is now being tried out in other town planning projects. This adopts a different shape of lot unit, increasing its width at the expense of its depth so that the single-family house of ordinary size may present to the street, not its acute-angled gable end, but its more reposeful, horizontal eave line. Such an arrangement undoubtedly composes better, considered from the street elevation, and where the country is level, and no large proportion of multiple-unit houses is possible, the street picture is considerably improved in actuality. On the other hand, in hilly country, and where the individual house unit is in any decided majority, one finds a long vista of gable ends, jutting one above another in a distressful succession, with the usual added disadvantage of having one side of the street appreciably higher than the other.

In such cases, therefore, the revised arrangement tends to

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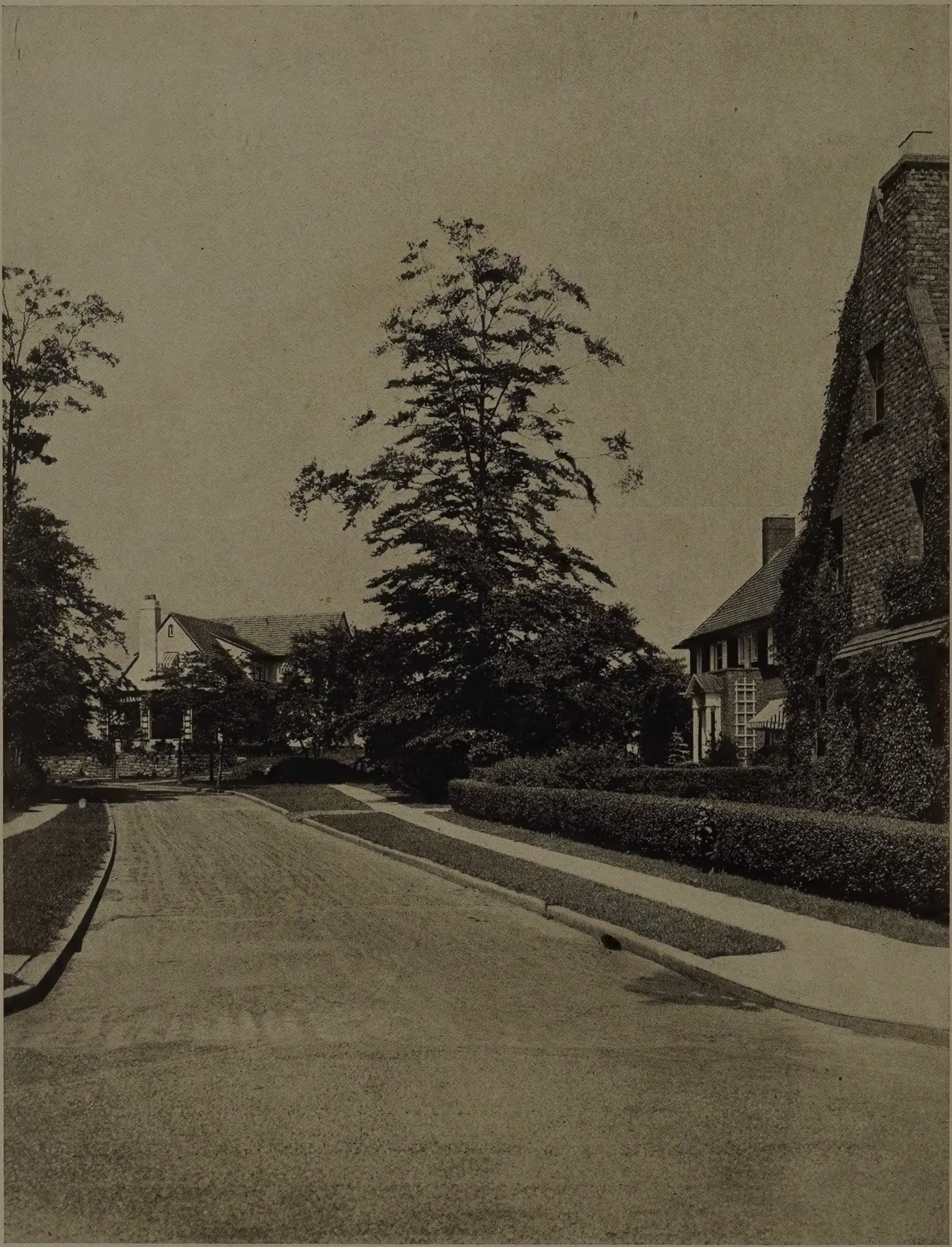


WENDOVER ROAD FROM GREENWAY NORTH.

CLOSED VISTA LOOKING UP GREENWAY NORTH.

(*Continued from page 167*)

defeat its own end so far as the improvement of the street picture is concerned. The ideal (or the best looking compromise), is perhaps that suggested when, in the former system of lotting, a special group is set back and turned lengthwise to the street; or in the latter, when in a similar group, the flanking houses are set close to the street and their roofs lines emphasized. In either case the antithesis is most welcome.

To produce such variety without making the blocks abnormally thin, or too irregular in depth, several alternatives suggest themselves, though no one of them is wholly ideal. The block may, for example, be kept the typical depth, with the usual shaped lotting at the ends; toward the middle of the block, the lot shape may be changed, déducting, say 25 feet from the depths of lots that would naturally back up to each other. The fifty feet thus withdrawn could then be utilized for private parking space dedicated to the use of all land owners of the block. The plan has numerous features in its favor, and the difficulties that arise as to title and maintenance of the private park, have proved, in the several instances where the scheme has been tried, to be not too great.

A second scheme reduces the depth of the block by only 25 feet, making the lots facing on one street 100 feet deep as against 75 feet for those abutting at the back. The same grouping of the two forms is then possible, provided, of course, the groups are reciprocally arranged on the two streets.

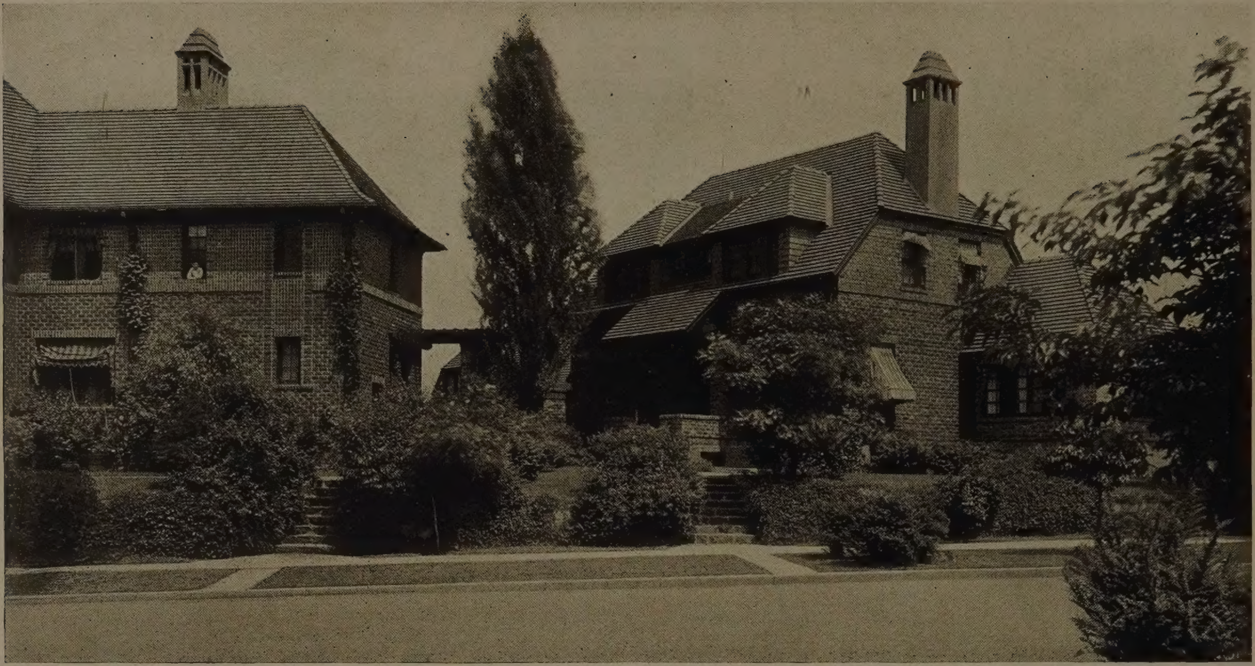
The economic questions involved must be studied for the individual cases as they occur. So many different elements govern the decision: the character of the land area to be subdivided; the class of development to be planned; the cost of land on a square foot basis; the comparative desirability of frontal space on the streets affected.

One may possibly feel some surprise that the map of Forest Hills shows no examples of the close, a form of grouping so frequent in the English garden suburbs. This intimate arrangement of houses, sequestered from the main streams of traffic, has such decided qualities to recommend it that it must ultimately be more generally adopted in this country. The present American aversion to it seems to be a survival of the leaning of primitive man toward a house always on Main Street, and a porch always on the front of the house. Since the latter practice is no longer the *sine qua non* that it was ten years ago, we may properly indulge hopes for a growth in appreciation of the close. The nearest approach to such a treatment in Forest Hills occurs in Ivy Place, which, while accessible from two directions and not, therefore, strictly a close, is yet so sequestered, so removed from the traffic currents that pass outside its limits that it possesses, or will possess as time softens its lines, most of the charms which characterize the close proper. May it serve as an educational feature—a decoy to induce American taste to a sounder basis for its judgment of values.

When one comes to the point of examining the several groups separately, one finds a surprising variety in size, form, treatment and placing. Their charm of design and setting either speak for themselves in the photographs, or have been amply spoken for in print. We are here chiefly interested in their relation to each other, to the streets, and to the town plan in general. It is apparent at once as we emerge from Station Square that the group, considered as a town planner's device, is valuable in forming a transposition from the broader massing of the square to the comparatively minute spotting of the individual houses beyond. To visualize this value, one has only to conceive the Village Green cleared of its present buildings and their places filled with single-family houses. The result is almost a *reductio ad absurdum.*

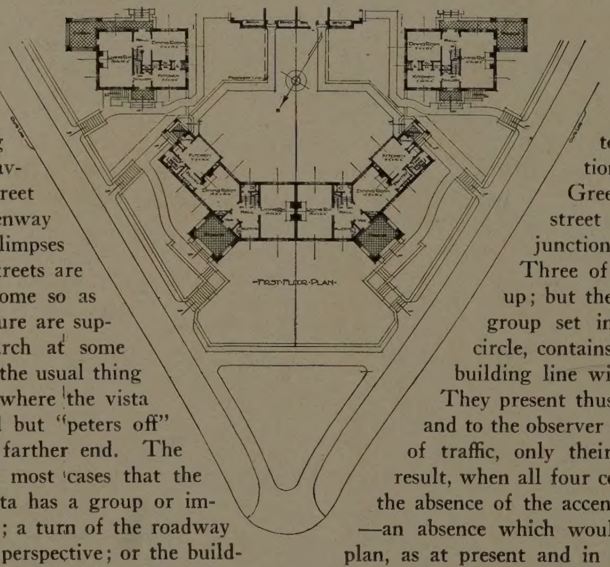
Only in lesser degree important is the other function of the group, already mentioned—that of introducing at strategic points in the plan, larger, quieter building and roof masses; of increasing the general scale of the development, and of avoiding pepper-and-salt dots of small houses, spread over acres of land. Such a collection, no matter how cleverly designed may be each house of the collection, produces tedium after a period, and if persisted in, nausea.

Perhaps the most interesting of the group designs is that just off Station Square along the railway embankment—a col-



DETACHED UNITS (plans below) GROUP AT GREENWAY NORTH AND MARKWOOD ROAD.

lection of fourteen houses planned in the general form of a crescent. Such a form is obviously the logical one, not only to utilize best the land, but to develop for the residents the best possibilities of the situation A straight-line group, such as are most of the others, would have forced each householder to face forever (or until his lease expired) the unrewarding aspect of the railroad embankment. The deep crescent affords what amounts to a private park in the middle, provides outlooks for everyone, and ignores the embankment.



The several photographs reproduced herewith will afford ample proof of the painstaking care and study that has been lavished on the building up of the street picture. Driving along Greenway North or Greenway South, the glimpses to right and left down the side streets are uniformly satisfying, or will become so as the remaining motives of the picture are supplied. One would have to search at some length to find one of the streets (the usual thing in the self-growing community) where the vista is neither terminated nor framed but "peters off" indecisively into oblivion at the farther end. The plan of Forest Hills provides in most cases that the vision be satisfied—either the vista has a group or important buildings at its extremity; a turn of the roadway lends decision and interest to the perspective; or the buildings are arranged to form a confining frame for a view of open country beyond. Of the first method, the group of stone-walled houses is an excellent example; of the second, note the charming little house by Mr. Frederic J. Sterner on Rockrose Place.

In any achievement of the extent of Forest Hills, it would be a miracle if there were no spots to be found subject to criticism, legitimate or at least debatable; in a task that has been the subject of such constant, long-continued and intensive study as has Forest Hills, it would be a marvel were there no spots where the temptation to over-study had not been indulged. It is, in fact, on this score that Forest Hills has been oftenest criticized. The procession of pictures is of such length, it is so entirely inevitable that each street corner will answer to its name and produce its picture; the danger seems to be lest in Forest Hills beauty shall become bromidic.

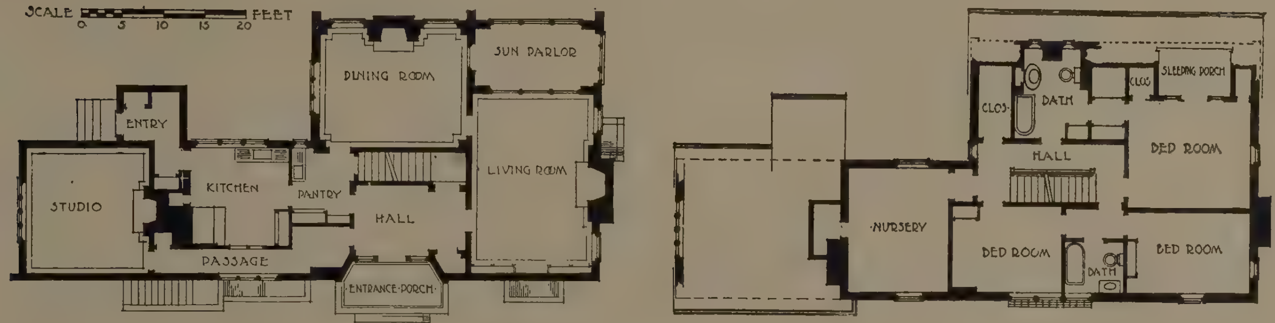
Among so much that is studied with elaborate care, any detail that hints at lack of consideration stands out the more plainly. Such a point appears to have occurred at the intersection of Slocum Crescent with Greenway North; where the general street layout expresses so important a junction in the form of a *rond-point.* Three of the corners are not as yet built up; but the fourth, instead of a dwelling or group set in relation to the radius of the circle, contains a pair of houses set on the same building line with the rest of Greenway North. They present thus, both to the centre of the circle, and to the observer approaching up the important line of traffic, only their forty-five degree corner. The result, when all four corners are built up, will be simply the absence of the accent in the town plan as laid down —an absence which would seem a loss. If expressed in plan, as at present and in buildings, trees and shrub planting, as apparently contemplated, this little place would have proved a delightful recall of the larger open spaces just behind, as well as a logical point of interest in the general layout. The lack will never be one to challenge the attention of the layman; it does seem from the town-planning view-point, that the most has not been made of one of the opportunities.

In contrast to this, a case of over-elaboration, a straining of relationship more important on paper than on the ground, is noticeable at the point where Markwood Road branches out from Greenway North.

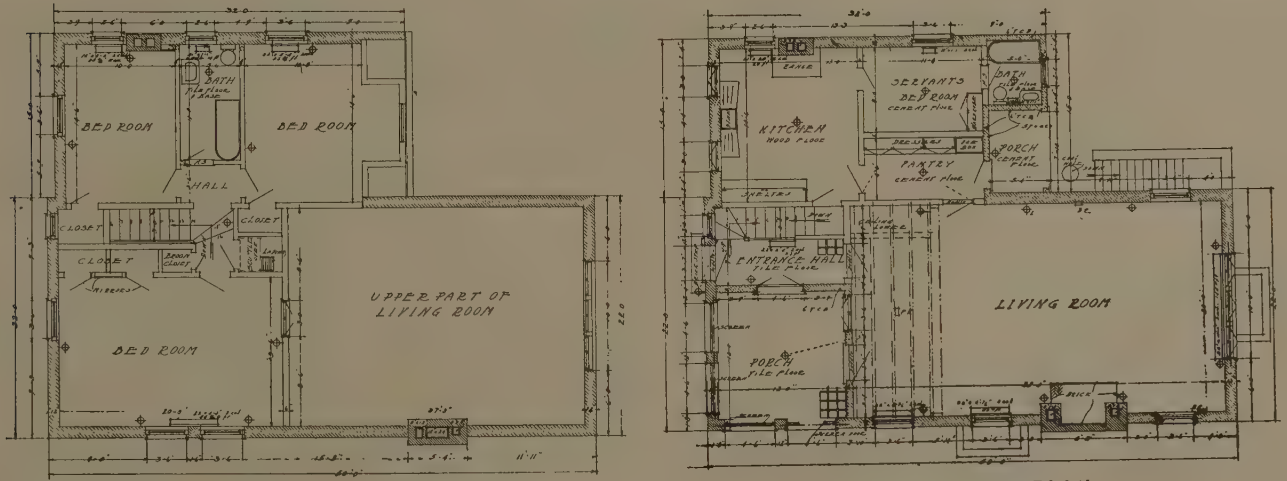
The central unit of this extensive group is effectively placed to give a focal point to close the long vista up Greenway North. Its mass is, logically, normal to the line of the main approach, and its side wings are bent to carry the roof lines naturally about into line with those of the two minor branches. The two separate houses of the group, however, instead of continuing this movement, are placed parallel with the central mass of the central unit—a setting which is certainly questionable. As shown in the photograph, the relation established is not an important one in actuality, whereas it results in at least two distinct disadvantages: the complexity of roofing angles, preventing any repose in the difficult transition from one branch road around the corner into the other; and an awkward relation of the separate houses to the side street, where the real parallelism cannot be seen at all, while the house itself, presenting its exterior corner to the passer-by, suffers both in its effectiveness and in its outlook.

The street and yard planting in Forest Hills is quite beyond comparison with that of any similar operation, at least when the elapsed time of production is taken into consideration. Here, again, if one were to venture suggestion it would be that from now on the emphasis might be well placed upon the provision of trees of dominating size at various points in the extent that now lacks them, rather than elaborating the display of low-growing shrubbery already bewildering in its profusion.

Not the least among the achievements at Forest Hills has been the success in minimizing the visual effects of constant new building—a condition that usually results in a scene of wide-spread devastation, slow to return to the normal. Considered as a major operation in town-building, these wounds to the landscape have been marvelously quick to heal. Even the scars will soon have disappeared—which is eloquent testimonial to the technique of the operators.



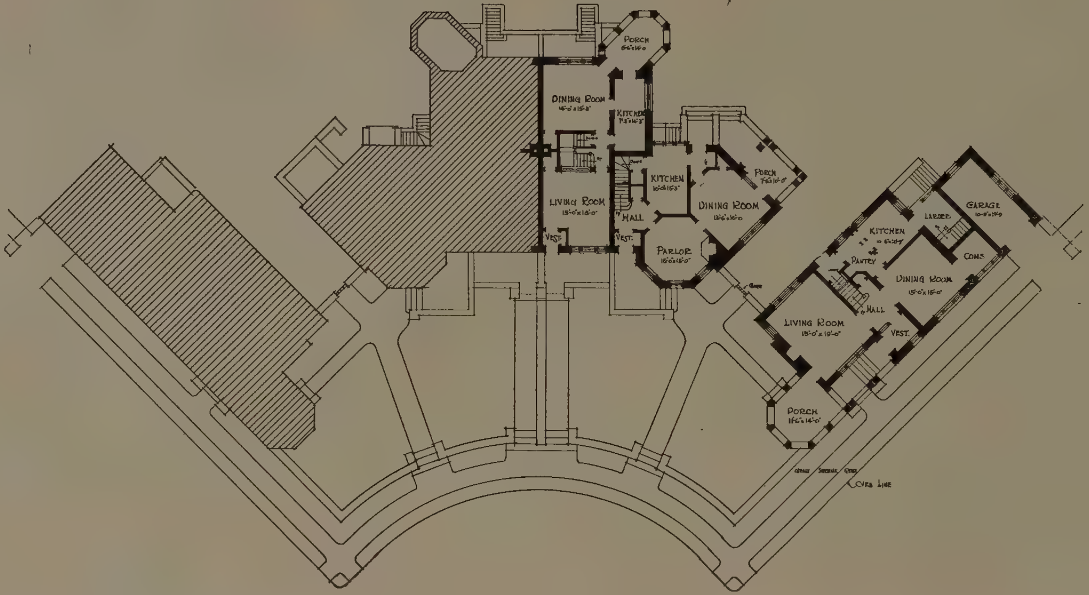
PLANS, HOUSE, BOARDMAN ROBINSON, FOREST HILLS GARDENS, LONG ISLAND. Albro & Lindeberg, Architects.
(See plate CXXIII)



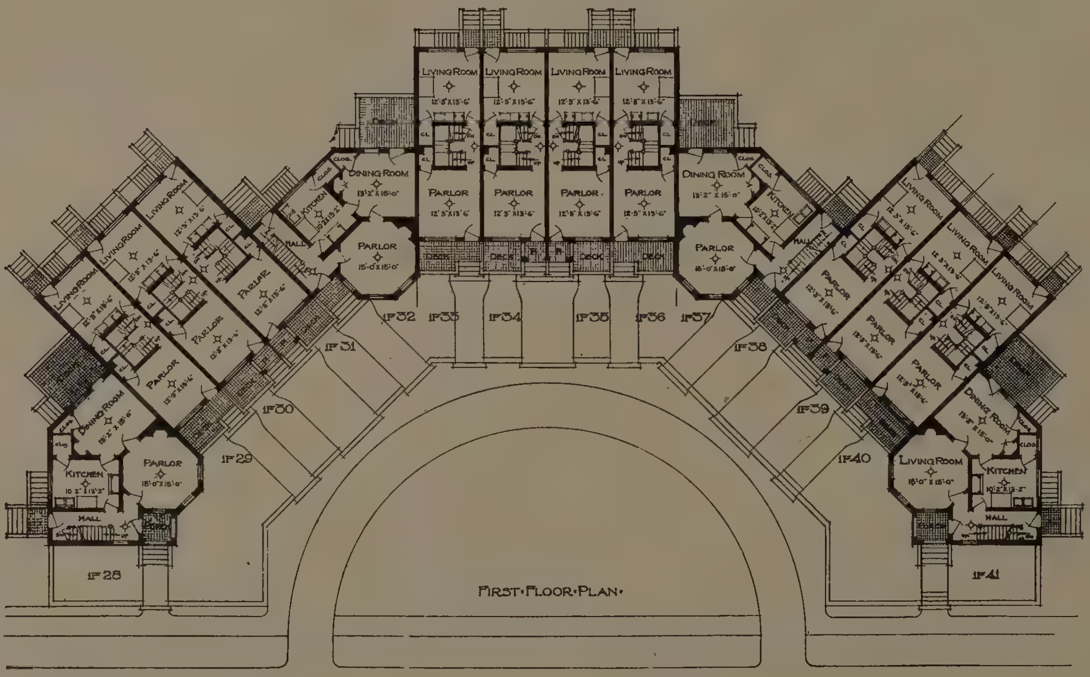
SECOND FLOOR PLAN
SCALE ¼" - 1'-0"

FIRST FOOR PLAN
SCALE ¼" - 1'-0"

PLANS, HOUSE, MRS. ELLEN B. KENDALL, FOREST HILLS GARDENS, LONG ISLAND. Fred'k J. Sterner, Architect.
(See plate CXXIV)



Group XXXIII. (See plate CXXI).



Group II. (See plate CXXII).

PLANS, GROUP XXXIII AND GROUP II, FOREST HILLS GARDENS, LONG ISLAND, N. Y. Grosvenor Atterbury, Architect.

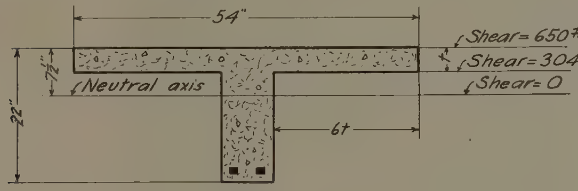
XIV. Engineering for Architects

By DeWitt Clinton Pond, M. A.

Mr. Pond has charge of the practical course in Architectural Engineering at Columbia University. He is the author of "Engineering for Architects" recently published in book form. This series, started in July, 1916 ARCHITECTURE, is a continuation of the previous series concluded in the issue of June, 1915.

IN the last article the sizes of beams and floor slabs, which are found in concrete construction, were discussed, and in determining the amount of steel in the beam, it was stated that the breadth and depth of the beam were assumed. Experienced engineers can make very shrewd assumptions, but, in every case, these assumptions must be checked to find if a beam is safe. In the article referred to, the amount of steel was found, and the beam was checked for shear at the supports, but there still remained the compression in the concrete to be investigated, and the horizontal shear—an item that is not referred to in the discussion of steel beams.

The beam under consideration is said to be a "T" beam, and this means that it is assumed to have the shape of a large T. As is shown in Fig. 85, the projecting arms on either side of the beam have lengths equal to the thickness of the slab multiplied by six. According to the New York Building Code the *minimum* result given by the two following equations governs this length.



FIGVRE 85

Length of arm = Thickness of slab multiplied by six.

Length of arm = Span of beam divided by six.

This ruling is different from that of the Join Committee, which states that the length of the arm shall be four times the thickness of the slab or that the cross of the T shall be not greater than one-fourth of the span.

In the case under consideration, the thickness of the slab is considered to be 4 inches, and the projecting arm becomes 24 inches or 2 feet. If one-sixth of the span were to be chosen it would be found that this length would become 20 feet ÷ 6 = 3.33 feet, and this result is considerably greater than that found above.

As in the case of the slab, the neutral axis is considered to be located at a distance below the top of the beam equal to three-eighths of the depth. This depth is always considered to be the *effective* depth, or the distance from the top of the beam to the centre of the steel. In the beam designed in the last article, the effective depth was assumed to be 20 inches. The distance from the top of the beam to the neutral axis will be three-eighths of twenty or 7.5 inches.

The area of the concrete, above the neutral axis, can be divided into two rectangles. These two rectangles will be denoted, for convenience, by the letters A and B. A is 4 inches deep and 54 inches long, and B is 6 inches wide and 3.5 inches deep. The code allows a maximum unit fibre stress of 650 pounds per square inch on the concrete at the top of the beam. It is assumed that at the neutral axis there is no stress at all. From the neutral axis to the top line of A there is a direct variation of stress from zero to 650 pounds. At a line, separating A from B, the stress becomes $(650 \div 7.5) \times 3.5 = 304$ pounds per square inch. This makes the *average* stress on A equal to $(304 + 650) \div 2 = 477$ pounds per square inch. The total stress on A will be $54 \times 4 \times 477 =$ 103,000 pounds. The stress in B will be $304/2 \times 6 \times 3.5 =$ 3,192.

According to the calculations in the last article, the stress in the steel was found to be 31,500 pounds and so it is apparent that the concrete will not be stressed to the allowable unit stress, and will have a sectional area great enough to withstand all compression put upon it. This follows from the fact that the total compression in the concrete will only be as great as the tension in the steel. If the concrete is capable of withstanding a compression of 106,200 pounds and if the actual compression, being equal to the total tension, is equal to 31,500 pounds, then the concrete is obviously safe.

If the compression in the beam is found to be too great, then there are four methods to be employed to offset this. In the first place, the depth may be increased, causing less tension to come upon the steel, and more area to be allowed to the concrete. The second method calls for the widening of the beam. The slab may be thickened by the third method, and the steel may be added to the concrete at the top of the beam by the fourth method. However, in the case given above it was not necessary to employ any of the methods.

If it is found advisable to add steel to the concrete the value of the steel is determined by the formula $S = n \times fc$, in which n is a constant, representing the ratio between the modulus of elasticity of steel and that of concrete. Under ordinary circumstances n equals 15. fc represents the unit compressive value of the uppermost particles of concrete, and this is usually assumed to be 650. This figure must be reduced by the ratio between the distance from the centre of the steel and the neutral axis, and the distance from the top of the beam and the neutral axis—this last distance being three-eighths of the depth or 7.5 inches in the present case. As the reinforcing steel must be 2 inches below the top of the beam, the ratio in this case will be 5½/7½ or 11/15. The formula then becomes $15 \times 11/15 \times 650 = 7{,}160$ pounds per square inch, which is the allowable fibre stress to be allowed on the steel. By dividing the excess in compression, should such an excess occur, by the stress given above, the area of the steel is found. The stress given by the formula is not determined upon the relative strengths of concrete and steel, but upon their relative elastic properties, and there should be no more compression in the concrete than there will be in the steel. It must be remembered that the figures given above were used for the purpose of explanation only. As the beam was safe there is no need of supplying steel in the top.

The next element of the beam to be found is the stirrups. These are simply ⅜-inch round bars, turned in the shape of the letter U, as shown in Fig. 86. The object of inserting these stirrups in a concrete beam is to reinforce the beam against rupture due to diagonal tension. It is apparent

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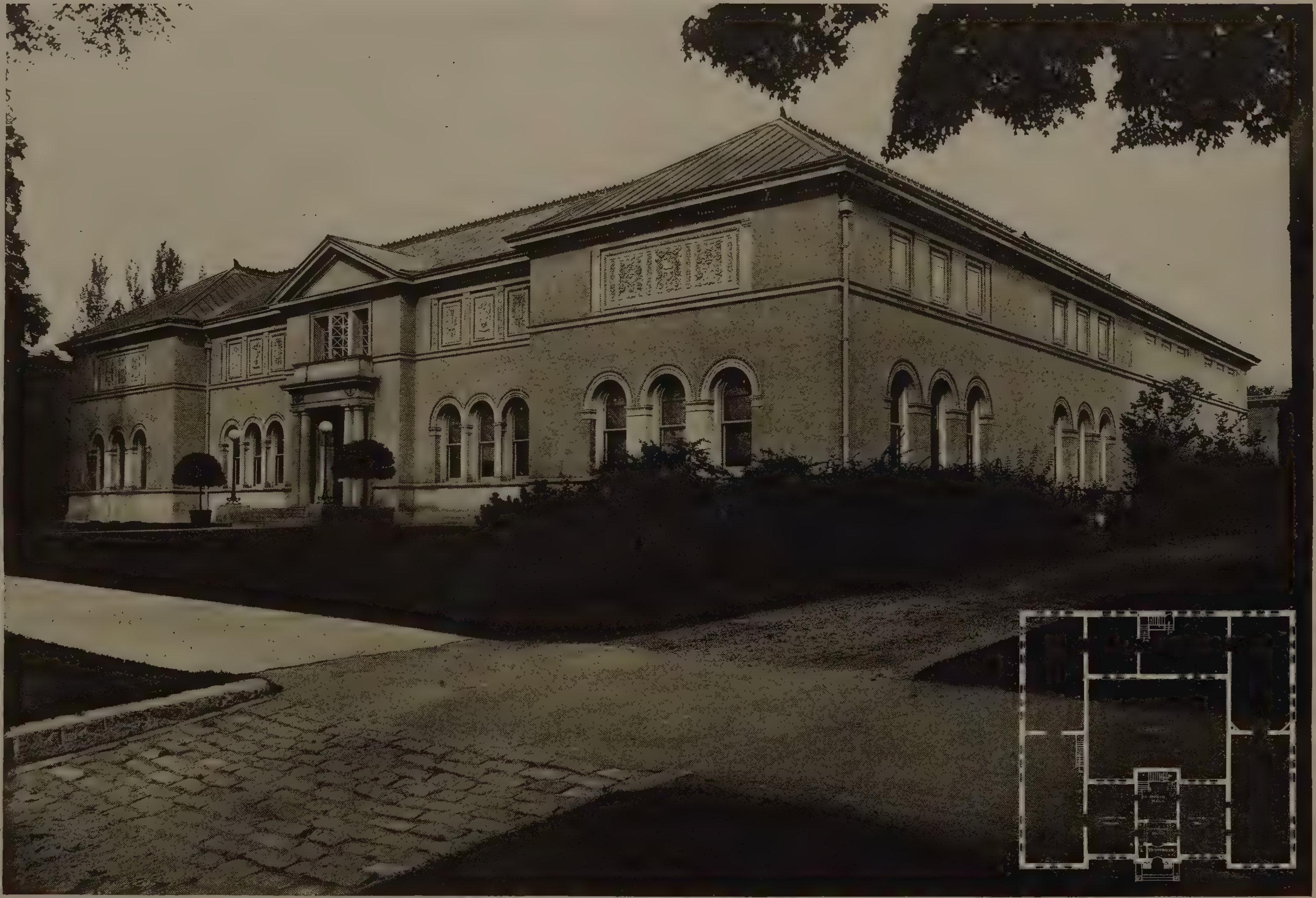

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Harding & Seaver, Architects.

(*Continued from page 173*)

that the upper layers of concrete will have a tendency to slide past the lower layers, and this tendency is considered to be equal to the shear per square inch at the end of the beam.

In the last article this shear was found to be equal to 131 pounds per square inch, and it was stated that this was safe according to the New York Building Code, which allowed 150 pounds, but that the Joint Committee allowed only 120 pounds. According to the code the shear is distributed in the following manner: 40 pounds per square inch is allowed to be taken up by the concrete, and 110 pounds by the steel. If the shear does not equal 150 pounds per square inch, then 40 pounds is allowed to be taken by the concrete, and the remainder by the steel. In the case of the beam, having 131 pounds shear, the steel will have to take up 131 — 40 = 91 pounds.

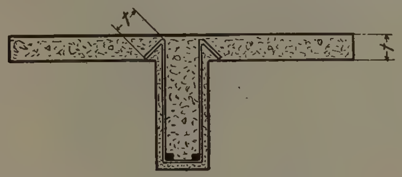


FIGURE 86

The Joint Committee distributes the shear in a different manner. Of the 120 pounds allowed, one-third—40 pounds—falls on the concrete, and two-thirds—80 pounds—falls on the steel. This proportion is followed even should the shear be less than 120 pounds per square inch. In case this should be only 100 pounds, then 33.3 pounds per square inch would fall upon the concrete and 66.6 on the steel.

Provided that the New York Building Department's ruling is to be followed, and the actual shear is 131 pounds, then 40 is allowed to the concrete and 91 pounds is allowed to the steel. In order to understand how this shear is distributed over the steel, it will be necessary to understand the shear diagram shown in Fig. 87. It will be noticed that at each support there is indicated a shear of 131 pounds, and that there is no shear at the centre. The shaded portion represents the shear taken up by the concrete and the light portion is the remainder which must be counteracted by the steel. The clear span of the beam is 19 feet, and the lengths AB + BC will equal 91/131 multiplied by 19 feet. 91/131 × 19 = 13.2 feet. This will give a length of 158.4 inches over which the shear will be applied, and as the beam is 6 inches wide, the total area will be 158.4 × 6 = 950 square inches. The shear, to be taken up by the steel, is found at the supports to be 91 pounds, and this diminishes to zero as B (Fig. 87). The *average* shear will be 91 ÷ 2 = 45.5 pounds per square inch. If the shear is 45.5 pounds per square inch, and there are 950 square inches, the total shear to be taken up by the steel will be 950 × 45.5 = 43,225 pounds.

To find the number of stirrups in *both* ends of the beam, this force (43,225) should be divided by the value of each stirrup. As stirrups are made from ⅜-inch round bars each leg of the "U" will have an area of .1104 square inches. As there are two legs, and each square inch of steel is capable of withstanding a tensile pull of 16,000 pounds, the value of each stirrup will be 2 × .1104 × 16,000 = 3,532 pounds.

The total shear was 43,225 pounds, and each stirrup has been found to have a value of 3,532 pounds, so there will be need of 43,225 ÷ 3,532 = 12.3 stirrups.

However, there will have to be allowances made for the bent up steel in the beam. In Fig. 88 there is shown a diagram of the reinforcing of the beams. It will be seen that the bars are bent up at an angle of 30 degrees through a point, known as the fifth point, and which is located at a distance equal to one-fifth of the span from the centre of the support. Only part of the steel is bent up in this manner, however, as it is required that one-half or more of the steel shall be run through on a line with the reinforcing at the bottom of the beam. The steel that is turned up must have a combined cross-sectional area equal to one-half of the total steel or less. In the case of the reinforcing of the beam under discussion, there were two one-inch bars found necessary and one of these bars must be run through, and the other turned up. There will, therefore, be one square inch of turned-up steel, and the department will allow seven-tenths of this steel to be used to withstand the horizontal shear. For this reason 7/10 of a square inch of steel is supplied by the bent up reinforcing bars to resist this shear.

It has been stated that ⅜-inch round bars were used for stirrups and that one leg of the "U" had an area of .1104 square inches, and two legs will have .2208 square inches, and that this is the area of steel supplied by one stirrup. It would therefore take 0.7 ÷ .2208 = 3, approximately, stirrups to supply the same amount of steel as is furnished by the bent-up reinforcing bar. Or, to turn the reasoning around, the reinforcing bar will take the place of three stirrups, at each end of the beam, or six stirrups in the entire length of the beam.

In place of the 12 stirrups called for above, it will only be necessary to supply 6, because of the resisting tendency of the bent-up steel.

In order to explain the reason for bending up the steel, it must be remembered that reinforced concrete beams are considered to be continuous beams and that the bending changes in direction, concave at the centre of the span, and convex over the support. The reinforcing in the centre of the span will therefore be found at the lower side of the beam, but over the supports this reinforcing must be at the top. It is the object of the designer to turn the steel up through the point of contraflexure, and this is assumed to be at the "fifth" point. The building department, however, requires that at least one-half the steel shall be carried through, so only one-half or less of the steel is bent up.

The code also requires that the reinforcing at the top of the beam shall have a combined cross-sectional area equal to that of the reinforcing at the bottom of the beam. If there are two one-inch bars used for reinforcing, then if one bar is turned up from the beam on one side of the girder, or other support, and another bar turned up from a beam on the other side of the support there will be two bars at the top and the conditions required by the building department will be satisfied.

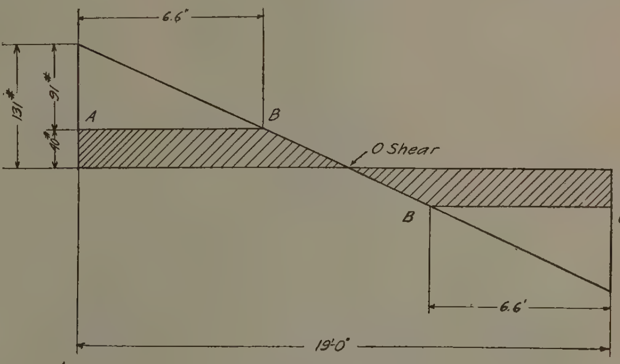
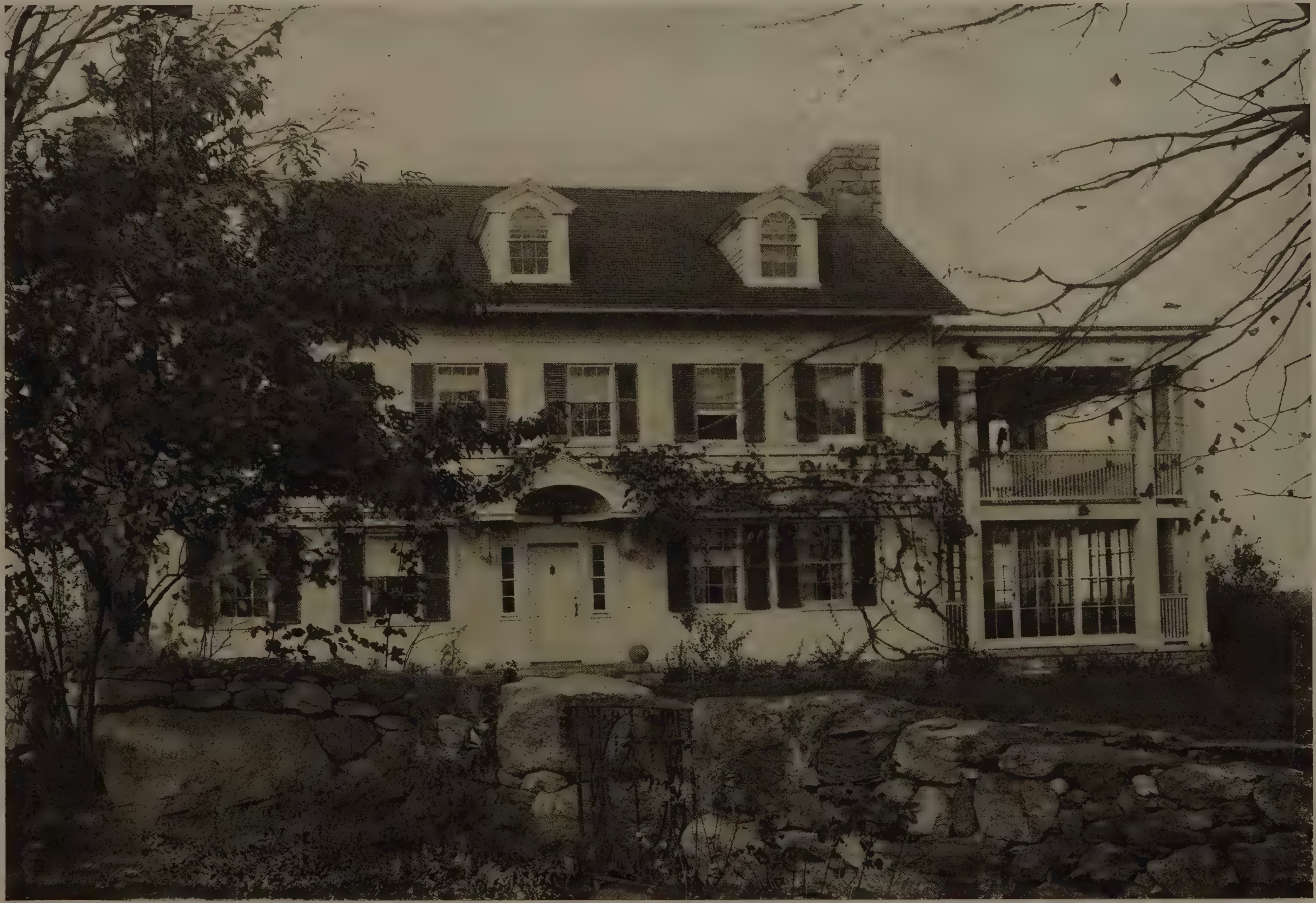


FIGURE 87

(*Continued page 177*)



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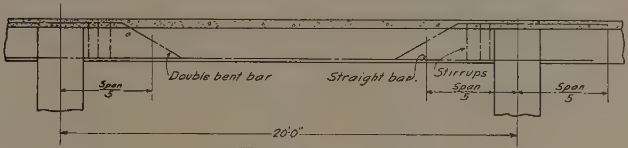
The bars at the top are carried over the top to the fifth point of the beam on the other side. It will be seen in the case of the girder referred to later that it will be necessary to add a bar at the top to fulfill this condition.

In reference to stirrups it may be stated that there is a rule which some engineers follow which requires that there should be the following number of stirrups and beams having spans as shown below:



FIGVRE 88

6 stirrups for 14′ 0″ or under
8 stirrups for 14′ 0″ to 18′ 0″
10 stirrups for 18′ 0″ to 22′ 0″
12 stirrups for 22′ 0″ to 26′ 0″

If the conditions for which the beam was designed are remembered, it will be understood that the bay in which the beam occurred was 20 feet long, and 16 feet wide, and that the beams were placed 5 feet 4 inches on centres and had a clear span of 19 feet. The girders, into which the beams ran, had spans of 16 feet. For the purpose of design, the loading on these girders can be as shown in Fig. 89. The total loading can be considered as concentrated at the two points where the beams are supported by the girders. These loads can be found in the following manner. As in the last article, the live load will be taken as 200 pounds per square foot. The floor slab will be 4 inches deep and will have a weight of 48 pounds per square foot. The weight of the beams, distributed over the floor area, was supposed to add 20 pounds to the dead load. It is only necessary to add the weight that the girder can be considered as distributing over the floor area. The girder may be assumed to be 10½ inches wide, and 2 feet deep. Girders are usually made 2 inches deeper than beams, and the beam designed in the last article was one foot and ten inches deep. If the slab is 4 inches deep there will be 20 inches of girder below the slab. If this is 10½ inches wide (Fig. 89) the area of the section below the slab will be 10½ × 20 = 210 square inches. The weight per foot will be 210 pounds. The girders are spaced 20 feet on centres and so the weight per square foot of floor area, which would be equivalent to the weight of the girder, would be 210 ÷ 20 = 11 pounds per square foot, approximately. The total weight per square foot would be as follows:

Live load	200 pounds
Slab	48 pounds
Beam	20 pounds
Girder	11 pounds
Total	279 pounds

If it be considered that all the weight of the floor shall be concentrated at the points where the beams meet the girder, then the square feet of floor carried by the beams, multiplied by the load per square foot, will give these loads. The clear span between girders is 19 feet and the beams are 5.33 feet on centres, so the load will be 5.33 × 19 × 279 =28,200 pounds.

The maximum tendency toward bending—or bending moment—will occur under either load and will be equal to the load at the support—in this case 28,200 pounds—multiplied by the distance in inches from the support to the load. 28,200 × 5.33 × 12 = 1,803,672 inch pounds or 1,804,000 approximately. The moments of this girder have been figured on the basis with the girder as a simple beam, but all concrete beams are generally considered to be continuous and so it would be necessary to reduce the bending moment by multiplying by two-thirds. This will give results as follows: 1,804,000 × 2/3 = 1,203,000.

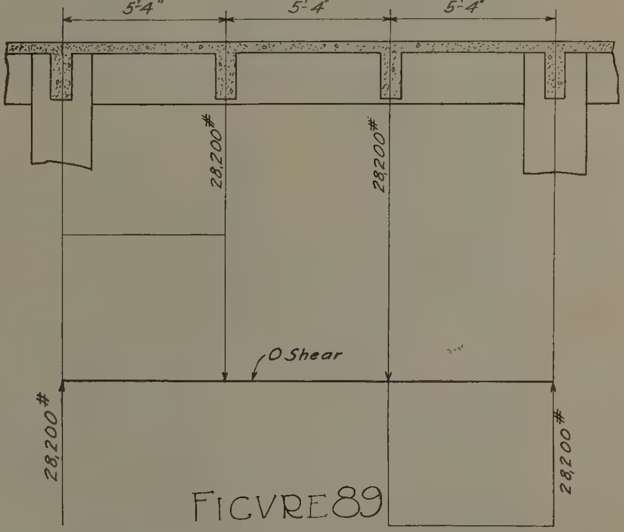
It has been explained that in order to find the stress in the steel in a reinforced beam, or girder, it is necessary to divide the bending moment in inch pounds by seven-eighths of the effective depth. In the girder under discussion there will probably be two lines of reinforcing steel. There are two inches of fireproofing required under the steel in the case of the girder and the bars will be spaced 2 inches on centres above each other so the distance from the bottom of the girder to a line half way between the layers of reinforcing will be 3½ inches. The beam will be two feet deep, so the effective depth will be 24 inches — 3½ = 20½ inches. To find the stress in the steel it is only necessary to insert this value in the following equation:

S = 1,203,000 × 8/7 × 1/20.5 = 67,100 pounds.

To find the number of square inches of steel necessary to withstand this stress, divide by the allowable stress per square inch of steel or 16,000 pounds.

67,100 ÷ 16,000 = 4.20 square inches. This can be made up of three 1-inch bars and one 1⅛-inch bar. These bars will be arranged in layers and on the top layer there will be two 1-inch bars which shall be bent up, or, what is known as "double-bent bars." The lower layer will consist of one 1-inch bar and one 1⅛-inch bar which shall be straight and run through, about 20 diameters past the centre line of the column.

The next item to be checked is the shear at the supports. The reaction and, therefore the shear, equals 28,400 pounds, and if this is divided by seven-eighths of the effective depth, multiplied by the breadth, the shear per square inch will be determined, or 28,400 ÷ (⅞ × 20.5 × 10.5) = 151 pounds per square inch of shear. The law allows 150 pounds and this result will be considered safe.



FIGVRE 89

The number of stirrups must next be found. As has been stated the law allows 40 pounds of shear per square inch to be taken by the concrete, and so if there is 151 pounds of shear actually exerted at the supports then, 151 — 40 = 111 pounds must be considered as coming upon the steel. The shear diagram for the girder is different from that of the beam,

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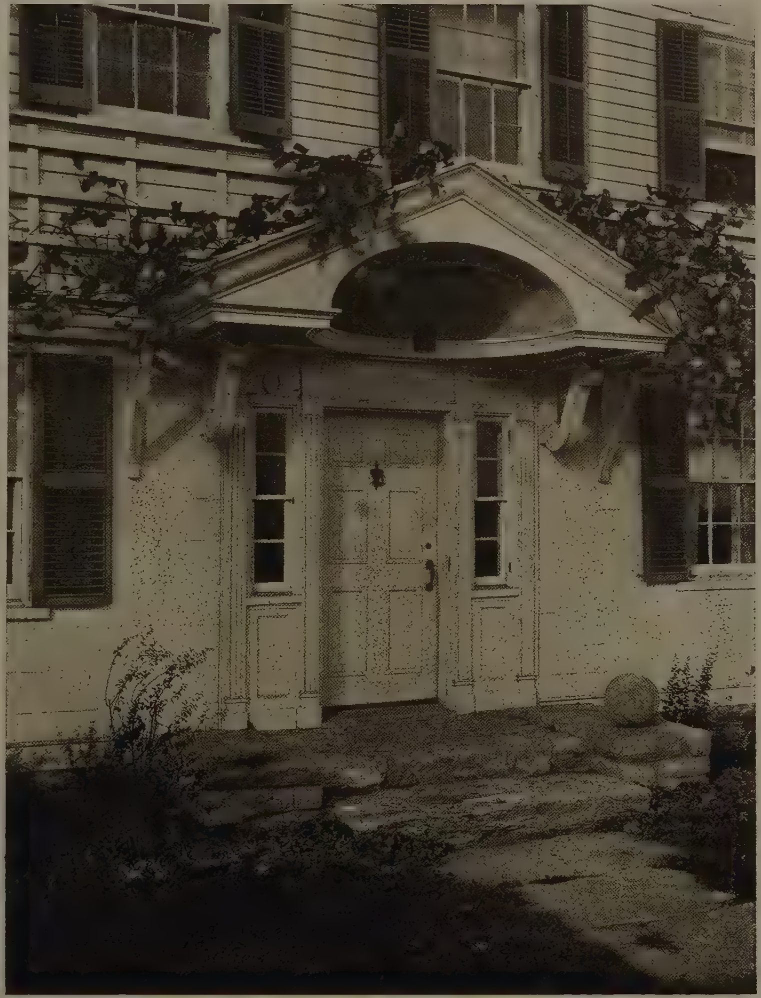

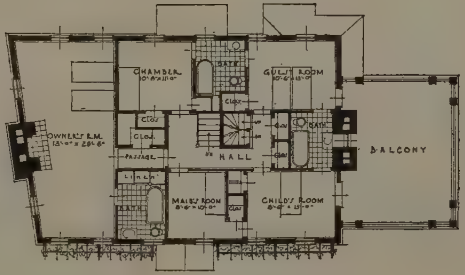

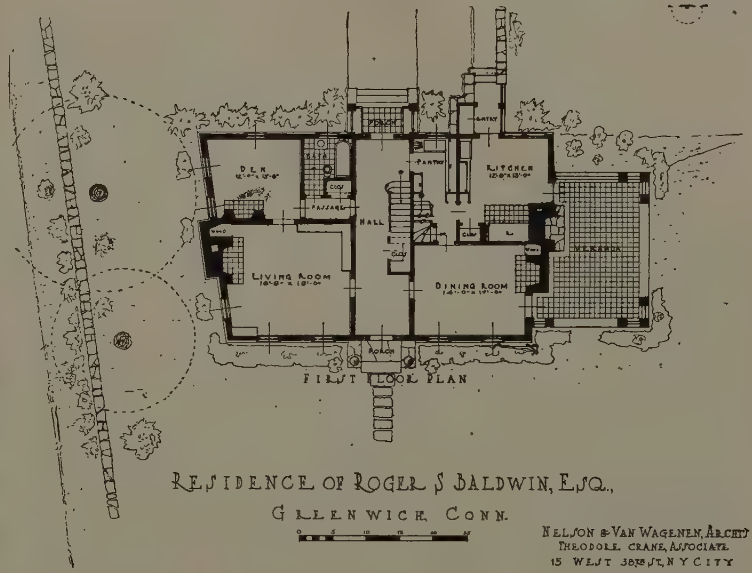

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in that the loads are concentrated and no shear exists between the two loads near the center of the span. The only shear on the girder will exist between the supports and the first load and will extend over an area 4.5 feet or 54 inches long and 10.5 inches wide. So the total horizontal shear at one end of the girder will be 111 × 10.5 × 54 = 63,000 pounds, and the shear at both ends will equal twice this or 126,000 pounds. The stirrups will be made of ⅜-in. square bars having an area of .1406 square inches per leg or .2812 square inches per stirrup. Multiplying by 16,000 the safe stress per stirrup will be found. .2812 × 16,000 = 4,500 pounds and if this is divided into 126,000 pounds the number of stirrups will be found. 126 ÷ 4.5 = 28 stirrups.

The bent up steel will have an area of 2 square inches at one end or 2 × 2 = 4 square inches at both ends. The law allows seven-tenths of this to be used for the purpose of resisting the horizontal shear so that the effective area will be 2.8 square inches. One stirrup will have an area of .2816 square inches, so 2.8 square inches will take the place of 2.8 ÷ .2816 = 10 stirrups. The total number of stirrups will be 28 — 10 = 18 that will be necessary.

It will be noticed that with two 1-inch bars turned up from either side of the support, there will be only four square inches of reinforcing at the top of the beam. The department requires that there should be at least as much reinforcing at the top as there is at the bottom and therefore it will be necessary to add one ½-inch square bar to the reinforcing at the top. This bar shall be long enough to extend from the fifth point of one girder to the fifth point of the other.

The compression in the concrete must be checked but as this offers no new problems, it will not be taken up in this article.

Legal Decisions of Interest to the Architect

These decisions appear monthly and are edited by Mr. John Simpson, the well-known lawyer.

BUILDING RESTRICTIONS—GENERAL BUILDING PLAN.

The Minnesota Supreme Court holds that where the owner of a lot subject to no building restrictions conveys it and inserts restrictive covenants cannot, in the absence of some general building plan, be regarded as inuring to the benefit of lots previously conveyed by him, and prior grantees cannot enforce such restrictions. Where, however, a number of lots in the same locality, and some contiguous to others, were conveyed by a single deed containing building restrictions applicable to all, and the grantee conveyed one tract to one person and later a contiguous tract to another, and in each deed incorporated the building restrictions under which he held his title, these transactions evince a purpose to adopt a general building plan. An owner need not have a multitude of lots in order to have a building plan. He may have such a plan for two lots as well as for more.—Godley *vs.* Weisman (Minn.) 157 N. W. 711.

NOTICE TO SURETY OF CONTRACTOR'S DEFAULT.

A contractor's bond provided that upon discovery by the owner of any act or omission on the part of the contractor that might involve a loss, the owner should give immediate notice to the surety. The contract provided that if at any time there should be evidence of any lien or claim for which, if established, the owner might become liable and which was chargeable to the contractor, the owner should have the right to retain out of any payment due or thereafter to become due a sufficient sum to indemnify himself. The owner before completion of the contract discovered that the contractor had not applied payments made to him in discharge of his obligations. In an action on the bond the Iowa Supreme Court held that this fact would not warrant a discharge of the surety on the ground that the owner had failed to notify the surety of his discovery, without any showing that the owner made payments after his discovery.—Zalesky *vs.* Fidelity & Casualty Co. (Iowa) 157 N. W. 858.

INTERFERENCE WITH RIGHT TO WORK MAY BE ENJOINED.

In an action against the members of a labor union seeking to enjoin them from conspiring to deprive the defendants of their employment, it was alleged that the defendants had threatened that if the plaintiffs did not desert their organization and join that of the defendants the latter would cause them to be discharged, and had used unlawful pressure upon and had intimidated owners of property not to employ the plaintiffs by threats of sympathetic strikes and otherwise, and in some instances had caused the discharge of the plaintiffs. The Massachusetts Supreme Court holds that the State statute of 1914, declaring that the right to work shall no longer be a property right, is beyond the power of the Legislature to enact, since it deprives the laborer of property without due process of law. It holds that the right to work is property of which one cannot be deprived by simple mandate of the Legislature, but it is protected by the 14th Amendment of the United States Constitution, and by numerous guaranties of the State Constitution, and the mere fact that it is also a part of the liberty of the citizen does not affect its character as property. The statute also prohibits injunction in all cases involving the violation of the contract of employment either by the employee or employer where no irreparable damage is about to be committed upon the property or property right of either. The Court holds this provision to be invalid, as depriving the laborers of the equal protection of the laws, since it cuts off the right to resort to equity respecting the property right of laboring men, and destroys the equality of laboring men with others. The Legislature may make many classifications in laws which regulate conduct and to some extent restrict freedom, so long as they have some rational connection with what may be thought to be the public health, safety or morals, or in a restricted sense (so as not to include everything that might be enacted on grounds of mere expediency), the public welfare. Weekly payment laws, employers' liability acts, workmen's compensation acts, inspection laws, based on number of employees, and numerous statutes similar in principle have been upheld. But all these and like statutes are quite different from one declaring that the laboringman either alone or in association with his fellows shall, as to his property right to work, be put on a footing of inferiority as compared with owners of other kinds of property when he appears in Court respecting that property right.—Bogni *vs.* Perotti (Mass.) 112 N. E. 853.

LIABILITY FOR LATENT DEFECTS.

A contractor employed to construct a garage purchased certain material, iron and steel, from a dealer to be used in the construction of the building, among which articles were four steel rods to be used in supporting the roof. To supply the

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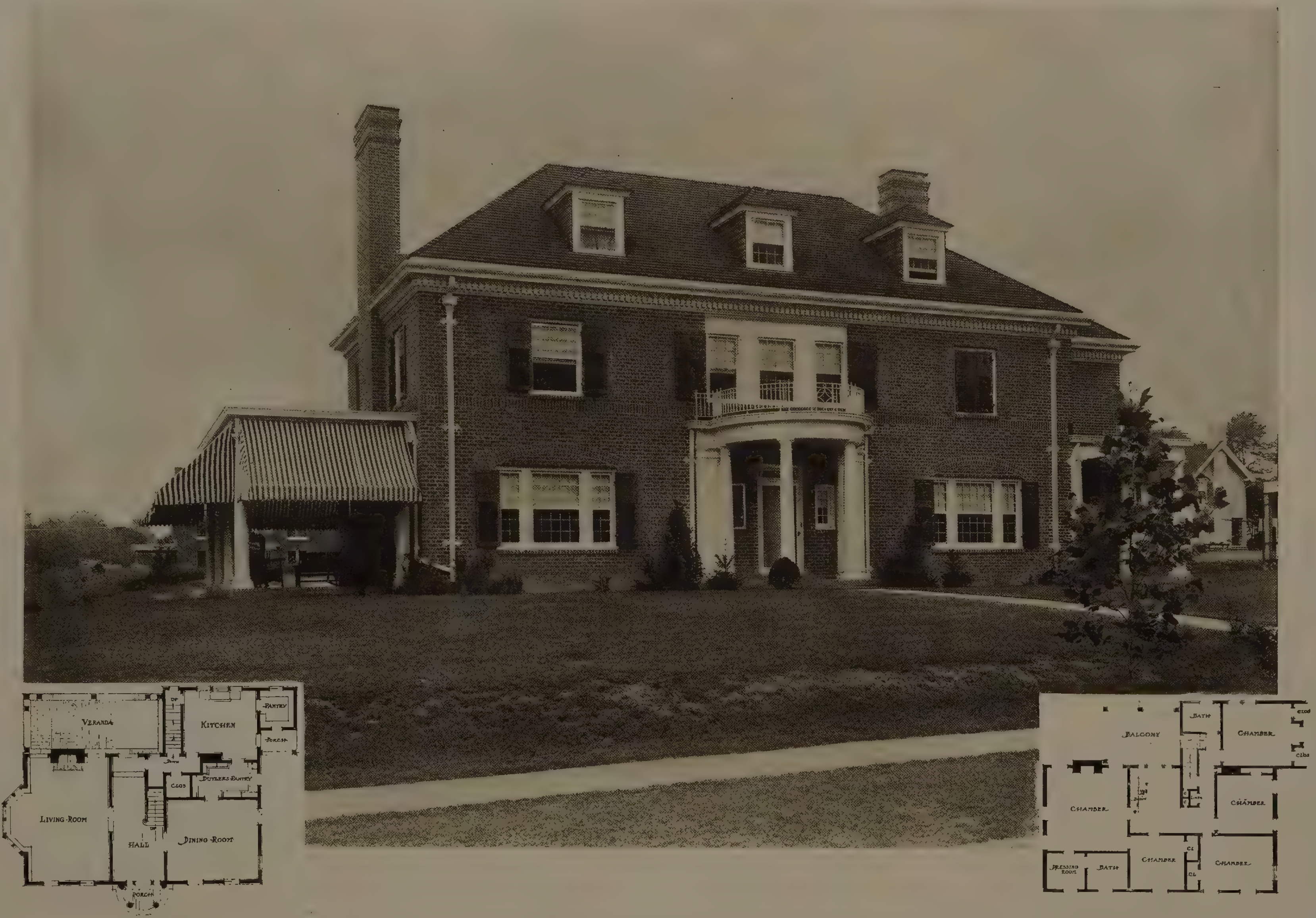

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Smith & Bassette, Architects.

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Editorial

The Ownership of Drawings—The Minor Arts
A Notable Experiment

THE usual contract between the owner and the builder provides that all drawings should be the property of the architect, and the architect generally manages to convince both parties to the contract that this is the proper place to include this statement. Where there is a formal contract between the owner and the architect, this provision is generally included, but as a rule the architect makes no claim to the ownership of the drawings, until the matter appears in the contract between the owner and the builder.

Certainly no architect, and probably very few other people, will deny that what the architect sells are his professional services in the matter of procuring a building for his client, which object is attained by a combination of drawings, written instructions and verbal directions, and the supposition is usually that he is selling the owner his services for the construction of ONE building; yet if this is the case, as it generally is, it would seem more professional and more business-like so to state the facts to the owner before the drawings are made, rather than to include the statement in a contract to which he is not a party, and in which such a statement can hardly be held binding, because of the fact that the architect is not a party thereto.

This statement may, however, have some effect upon the builder; plenty of builders have been known to use drawings made for one house, to construct others, without payment, either to the owner of the building for which the drawings were originally made, or to the architect who made them. For this reason only, as an admonition to the builder, it may be well to include the clause in the contract between the owner and the builder. Nevertheless, when such a case arises, the position is a difficult one for the architect, especially where the builder is located away from the immediate field of practice of the architect.

That this discussion is not purely academic is proven by facts which were only recently brought to our attention. A New York architect designed a small country house in a Pennsylvania city, a photograph of which was used as an illustration to advertise some material, the location of the house being given, and the owner's name attached. A gentleman in Virginia, seeing the advertisement, was attracted by it, and wrote to the owner asking for the name of his builder, apparently having confused the "builder" with the "architect," as is not infrequently the case. The owner, not realizing this, was good enough to furnish him with the name of the builder, and the Virginia man wrote to the builder asking him if he would sell a set of the drawings, which he did for $50. Now what means is there by which this harm can be undone? Evidently none. The architect might sue the Pennsylvania contractor for damages, but the distance from New York is so great, and the amount of damages which might be found by the Pennsylvania jury so problematical, that only a vengeful or a foolish person would take this course. Again there seems to be a legal question as to whether it is not the owner of the original house who should be brought into the case, because it was he who furnished the contractor with the drawings, and not the architect direct, although the contract between the owner and builder provided that the plans were the property of the architect.

Perhaps, in many cases, the jury would bring in no verdict for damages, since the architect would be unable to show that he had suffered any damages; he certainly has not lost any money which he already had, but only the possibility of an additional commission, and it is extremely probable that, as the architect would not have sold copies of the original drawings, he would never have secured the commission.

Yet the whole situation is manifestly unfair; unfair to the owner, who did not wish his house to be copied, as well as to the architect whose plans were thus used, and there does not seem to be any reasonable or simple way in which such misuse of drawings can be avoided. The copyright mark might perhaps protect, but as offenses against the copyright act are rarely prosecuted by the Federal Government, and suit must usually, if not always, be brought by the person whose copyright was infringed, the architect would not seem to have a very much better chance than he has under the present system; as a matter of fact his chance might be less, since if the drawings were changed in a single detail on every one of them, they would no longer be covered by copyright.

The other case in which there often is a question of misuse of drawings is where the owner of a building keeps one or two sets of drawings, and after his own house is completed, either hands them on to one of his friends, or sells them to somebody who may want a similar building, for a sum comparatively insignificant. In a case like this the architect is again in a poor position. It has been held many times that unless the architect had a contract direct with the owner providing that the drawings are his, he could establish no right to control their future use. The contract between the owner and the builder has sometimes, in such cases, been barred from being placed in evidence, on the quite comprehensible ground above stated, that the contract between the owner and the builder is not the thing in question, and that the architect is not a party to this contract.

Secondly, when it has been admitted that the drawings are the property of the architect, the amount of damage sustained has been variously held. Sometimes it is assumed to be what the owner had paid the architect originally; sometimes it has been only the amount the owner was able to secure for a second use of the drawings; and thirdly it has sometimes been held to be the amount which the drawings cost to make, and in still other cases jurors have held that the damage was purely technical, and have awarded the architect a verdict for some nominal sum; $1.00 perhaps.

The situation is one unpleasant to all architects, and one for which there seems to be no satisfactory remedy in view.

THE pleasantest thing about the present artistic situation is the tremendous development and improvement in the so-called minor arts; such as the design of wall fabrics, textiles, furniture, metal working of all kinds, including jewelry, and even tableware and porcelains. There is not one of these fields in which there have not been very notable advances made in the past few years, whether the processes have continued to be entirely mechanical, or whether they have reverted to hand manufacture, as has been the case in some lines.

Take for example the design of jewelry; about ten or twelve years ago anyone who wanted something really lovely and not of distinct stereotyped pattern in jewelry, was compelled to go to one of the very small group of specialists in such work; today one can hardly go into any jewelry store without finding a great number of designs, both unique and beautiful, executed in all sorts of metals, and set with all sorts of stones. One has always been able to go to Tiffany's and be sure of getting good commercial value in diamonds, and perhaps, if one were that sort of person, a well-matched string of pearls; today one can go to Tiffany's and purchase diamonds set in the loveliest possible designs, or aqua marines set in no less beautiful patterns; the jewelists seem to have realized that metal working is an art in itself, depending less upon the value of the stone which the metal surrounds, than upon the artistic quality of the setting in which the stone is placed.

We have had, therefore, within the past few years, a great increase in the number of semi-precious stones in settings of gold, silver and platinum, which are cheap and very beautiful. Nor is it necessary any more to go to one of the first rate stores to buy beautiful articles. The paste imitations, the so-called "synthetic" gems and the semi-precious stones set in base metals of purely commercial manufacture, turned out in large quantities, are today, as a rule, designed with a care which the best of our jewelers could not have surpassed fifteen years ago. In jewelry, at least, we have "art for the masses."

In wall coverings the improvement has not been so rapid, or so marked, perhaps because wallpaper and fabrics long ago attained a higher standard of design than was the case in most of the other minor arts. The question of late has been largely one of refinement in pattern, and the introduction of new and more subtle tints, rather than in any marked change in methods of design. The general advance, as far as wallpaper goes, has been in the direction of developing papers which would have the appearance of being a single color, but which are built up of a number of various tints, much as the impressionist builds up the blue of his sky from small spots of different colored pigments, which in the eye combine into blue.

In textiles it is hardly necessary to note the advance. Textiles fortunately serve other purposes than those of hangings and draperies, and where women are constantly demanding new patterns and new colors for their dress, the textile designed specifically for other purposes must necessarily share in the growth of knowledge due to such constant experimentation in textile. Perhaps the most interesting of all the recent developments has been the revival of the strong patterns of the old English chintzes, which, like most other novelties, have been used with less regard to their artistic design and coloring, than to the fact that they are unusual. Of course, it is very easy in any art to mistake novelty for progress, and probably this is nowhere more true than in these minor arts.

The advance in the quality of furniture design need hardly be commented on, and yet of all it is probably the advance which has been of most use to the architects, and which has been most notable in itself. In the first place the number of woods used for making furniture have been considerably increased, and the finishes used on these woods have been very completely changed. Architects have learned from the furniture manufacturers that mahogany does not need to be red, or walnut yellow or black, and the magnificent dull finished brown mahogany with its selection of fiddle back borders and crotch veneers has set a new standard for the treatment of this wood. Furniture design has fortunately developed along sound, rational lines; the furniture of today is made with an eye to durability and stability, as well as to beauty. We no longer turn the legs of our chairs down to the thickness of a lead pencil, and expect them to last for generations, or expect to put them in a parlor with a crochet tidy acting as a sign, "This chair is not to be used," our chairs as a rule, being made with as much of an eye to comfort and durability, as to conform with some particular period or crochet in the designer's mind. It is perhaps unfortunate that most of our furniture design should follow so closely old patterns, and that our furniture designers should, to some extent, at least, confine themselves to making good reproductions, rather than new pieces of a distinctly personal quality of design. There are probably two reasons for this; in the first place, we can hardly learn to walk before we learn to crawl, and just as the architects have been passing through a long period when they have been copying pretty closely the designs of other countries, to emerge at last into a time when they can handle the knowledge thus laboriously acquired with some freedom, and some personal feeling, we may expect the furniture designers to develop at length old designs with freshness and vigorous personality.

The one minor art in which it can be truly stated there has been no development, is that of carpet making. We are using today for practically all good work, carpets which, however beautiful in themselves, are after all expressions of a barbaric and alien art, which do not conform except in color, to the designs of the rooms in which they are laid, and which oftentimes, in pattern and scale, are far from harmonizing with the furniture or interior treatment of the rooms. It seems as if it should be possible for us to develop in this age an entirely new treatment of floor coverings. In the Eighteenth Century in France such an art did flourish, and while many of the products of that art today seem to us interesting only as curiosities, or to be even positively ugly, it is probably because we have become so accustomed to regarding the Oriental carpet design as a standard; and while we would not venture to suggest the lines along which the design of our floor coverings should proceed, we nevertheless feel very strongly that the lovely colors of the toned Oriental rugs could possibly be incorporated into designs more reasoned and more appropriate to the standards of our generation.

COLUMBIA UNIVERSITY has inaugurated a notable experiment in co-operation between the teaching and the practice of architecture. On the assumption that nothing but good could accrue to both school and profession through a proper understanding and reciprocal appreciation of one another's provinces, the University authorities decided to invite three architectural societies of New York City to elect three practicing architects each, to form a committee of visitors, whose advice, as based upon periodic inspections of the school's plant or equipment, current work, and mode of teaching, could be depended upon as a guide in checking up scholastic results by professional standards and demands. The three societies and the elected members from each to compose this committee are the following: From the New York Chapter of the American Institute of Architects, Bertram G. Goodhue, Charles A. Platt and Egerton Swartwout; from the Society of Beaux-Arts Architects, Thomas Hastings, Henry F. Hornbostel, and Lloyd Warren; from the Alumni Association of the School of Architecture of Columbia, Goodhue Livingston, John Russell Pope and I. N. Phelps Stokes.

WHEN you build do you look forward and picture your building in ten or twenty years from now? Or are you so desirous of having your building under way in the quickest time that scant consideration is given to the future? Is the new building to be only a "one-day wonder" which in a few years will degenerate into an eye-sore to everyone interested in it? says Mr. S. M. Fechheimer, editor of Modern Building.

No amount of present economy will compensate for future disappointments. The saving of a few days now is wasteful when compared to years of future aggravation. "What might have been" is poor solace for mistakes that can never be corrected.

Many factors determine the future service which a building will give. In the planning of it, thought must be given to future needs. If it is a factory, provision must be made for future growth so the manufacturing will always proceed in the most efficient manner. This involves adopting a general plan for the entire plant even if only a small fractional part of it is built at the beginning. If it is a store or office building, possibly the location might only warrant a two-story building at present but with the future growth of the city and increase in property values, additional stories would be most advisable. Then that building must be planned so that columns and foundations are sufficiently strong to carry the future stories. Similarly in other buildings, the possibility of future growth and development must be carefully considered in the planning.

The actual future worth of the building depends upon the construction and the materials that are used in its construction. Methods can be adopted so that the building will not depreciate in ten, twenty or fifty years. Permanent, fireproof construction is essential and will be of greater importance in the future than it is today. In a decade from now the building that is not fireproof will be of little value to anyone, just as twenty years ago the fireproof building was a distinct novelty. Public welfare will insist on much more rigid requirements to protect life and property. The building that is permanently constructed throughout will not depreciate in value and will pay for its slight additional first cost in saving of repairs and up-keep besides lower insurance rates.

Another modern tendency in building construction which will undoubtedly continue to be a permanent feature of buildings, is better natural lighting. The tendency is well established toward large windows to giving ample daylight to the interior, and equipped with steel sash to eliminate the fire danger. Better lighting and ventilation are only indications of the general movement everywhere towards better sanitation and health. These principles are basic as applied to all the equipment of the building.

Look over the buildings that were erected only a few years ago and are now obsolete; you will find that they were poorly constructed and dimly lighted and generally unsanitary in equipment. The present day tendencies are sure to gather strength in the coming years, accentuating the features of greater permanency, better sanitation and higher standards of living. Some far-sighted builders, years back, foresaw this tendency and planned for the future so that their buildings are still giving efficient service and have not materially depreciated in value.

When you build today build for the future. You will receive handsome returns in personal satisfaction and in cash revenue.

(*Continued from page 179*)

rods of the length ordered it was essential that several shorter rods should be welded together. Those furnished appeared to be sufficient, although it was subsequently revealed that two of them contained a latent defect in the weld. The contractor inspected the rods with due care and installed them in trusses to carry the weight of the roof. About seven months after the building was completed, the roof collapsed under the weight of an accumulation of about 14 inches of snow. Two of the steel rods had separated at the point of the weld in each, the defects being latent and not discoverable by the exercise of ordinary care on the part of either the dealer or the contractor. Although he was under no special contract obligation to do so, the contractor reconstructed the roof for the owner at an expense of $268.55, as he said he felt morally responsible. He subsequently sued the dealer for that amount, on the ground that there was an implied warranty on the dealer's part to the effect that the rods were in all respects sufficient for the purpose for which the dealer furnished them. The St. Louis Court of Appeals held that the contractor must be regarded as having voluntarily expended $268.55 in reconstructing the roof for the owner because of his high moral sense, and not because of any liability which the law cast upon him. Had he manufactured the rods himself, he might have been liable to respond to the owner for the latent defect in the weld because of the failure of his servants to exercise ordinary care with them. But he purchased them from a reputable dealer and installed them in good faith, after inspection, without knowledge of the latent defect. It was conceded he exercised ordinary care in the premises, and this being true, no enforceable litigation against him appeared after the completion and acceptance of the building. The expenditure of $268.55 in reconstructing the roof must be regarded as voluntary on his part, and therefore not enforceable against the dealer from whom he purchased the rods.—Flannery *vs.* St. Louis Architectural Iron Co. (Mo.) 185 S. W. 760.

CONSTRUCTION OF CONTRACT.

A contract between the general contractor for a building and the subcontractor for painting, the specifications requiring "two coats of creosote stain of gray color to be selected by the architect," is held to mean that the material of the gray color stain was to be selected by the architect as well as the color.—J. B. Evans Const. Co. *vs.* Hatton (Mo.) 185 S. W. 1191.

UNLICENSED ARCHITECT—RECOVERY FOR SERVICES.

By an ordinance of the city of Grand Rapids architects were required to pay an annual license fee of $5 and furnish a bond, and the ordinance provided that any person engaged in the planning or supervision of the erection, enlargement or alteration of buildings for others and to be constructed by other persons than himself, should be regarded as an architect within the meaning of the ordinance. In an action for the contract price for certain plans and specifications for a building which the defendant contemplated erecting in the city, but afterwards abandoned, it appeared that the plaintiff was following the business of builder and contractor in the city, that the architect who drew the plans and specifications was in the plaintiff's employ, and that neither the architect nor the plaintiff had taken out a license. The Michigan Supreme Court held that the plaintiff could not recover, under the rule that, where a license or certificate is required by statute as a requisite to one practicing a particular profession, an agreement of a professional character without such license or certificate is illegal and void. The plaintiff argued that the rule did not apply to this contract because he told the defendant that he was not an architect; that if the defendant wished, he would employ one; and in pursuance of this suggestion he turned the job over to the architect in his employment. The Court said that there would be force in this argument were it not for the fact that the plaintiff by his own testimony brought himself squarely within the definition of an architect as defined in the ordinance. He testified that he was a builder and contractor, and that he submitted a proposition in this case, whereby he was to oversee the construction, if the contract was awarded to another. The situation was, therefore, that of an architect, as defined by the ordinance, employing an unlicensed architect to prepare plans and specifications for one of his clients. It was held the rule applied to such a case, and that, whether the plaintiff be regarded as an unlicensed architect, or as merely a contractor and builder, who knowingly employed an unlicensed architect to do the work, he was barred under the rule from recovering on the contract. The mere fact that the ordinance had never been enforced by the city officials did not affect its validity. It was a rule of law in the city until repealed.—Wedgewood *vs.* Jorgens, (Mich.) 157 N. W. 360.

"SOIL, EARTH AND STONES" EXCLUDES LEDGE OF ROCKS.

A contract requiring the contractor to excavate all "soil, earth and stones," does not, the Massachusetts Supreme Court holds, oblige him to excavate a ledge of rock not known to him at the time of the contract. Upon discovery of the ledge, the contractor called it to the attention of the architect, and the latter appears to have decided that the work of excavating the ledge was not included in the contract, but he gave no written order for its excavation. The contractor did the work of excavation and it was held that a clause in the building contract that alterations should not be made in the work except by written order of the architect did not apply to the removal of the ledge, as that was wholly without the scope of the contract. As the owner knew that the work was being done by the contractor, assented thereto, and received the benefits, although erroneously believing the work to be covered by the contract, the trial court was held warranted in finding that the contractor was entitled to recover for the work.—Howard *vs.* Harvard Congregational Soc. (Mass.) 112 N. E. 233.

WHERE PAYMENTS FOR WORK DONE NO DISCHARGE OF SURETY.

A contractor defaulted, and the owner finished the work at a cost in excess of the contract price. Payments for the work had been made by the owner to a party other than the contractor, with the contractor's consent, and on certificates from the architect that the money was due and owing on the contract. In an action on the surety's bond, the Pennsylvania Supreme Court held that the surety was not discharged by such payments, in the absence of a showing that it had been prejudiced thereby, the liability of the surety having been by so much reduced.—Hardie *vs.* Bateson (Pa.), 97 Atl. 465.

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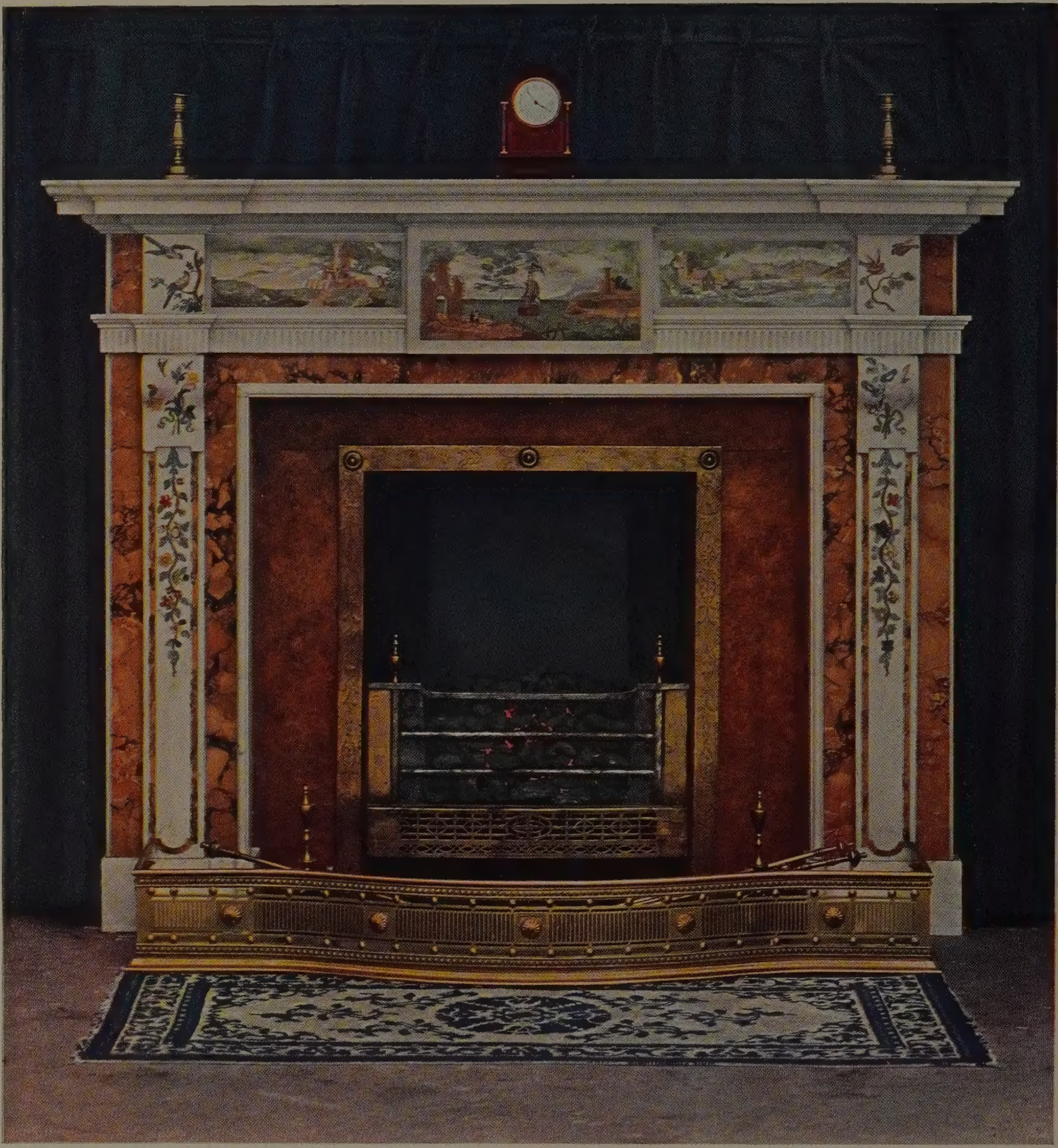

A BOSSI MANTELPIECE FROM RATHFARNHAM CASTLE DUBLIN COUNTY IRELAND

This is an authentic example of the work of Bossi the great Italian sculptor It was executed for the Earl of Rathfarnham at the time of the restoration of the castle in the year 1771

The mantelpiece is of carved statuary marble with grounds of old Convent Sienna The inlaid frieze panels depict local scenes The side blocks, consoles and pilasters are ornamented with birds and flowers

Bossi worked by a secret process which is practically a lost art, so carefully and successfully did he guard it from imitation

The mantelpiece was brought to America by, and is now in the possession of Arthur Todhunter, New York